FLIGHT

MAGAZINE

DECEMBER 1961
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DEC 19 1961

THE HUGHES 269A *(See page 38)*

New passengers... New fares...

TECO INC.

"The FORM-FITTED
Mason Seat"

INCREASES REVENUES

■ The "Mason Seat's" *32-inch* spacing provides passengers with more comfort and traveling pleasure than any other coach seating.

■ It permits airlines to penetrate new markets of people who have never flown, people who customarily have utilized surface transportation.

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the FIRST...

Horton-Horton is proud to have been commissioned to accomplish the interior and exterior of the world's first corporate jet — a Lockheed JetStar!

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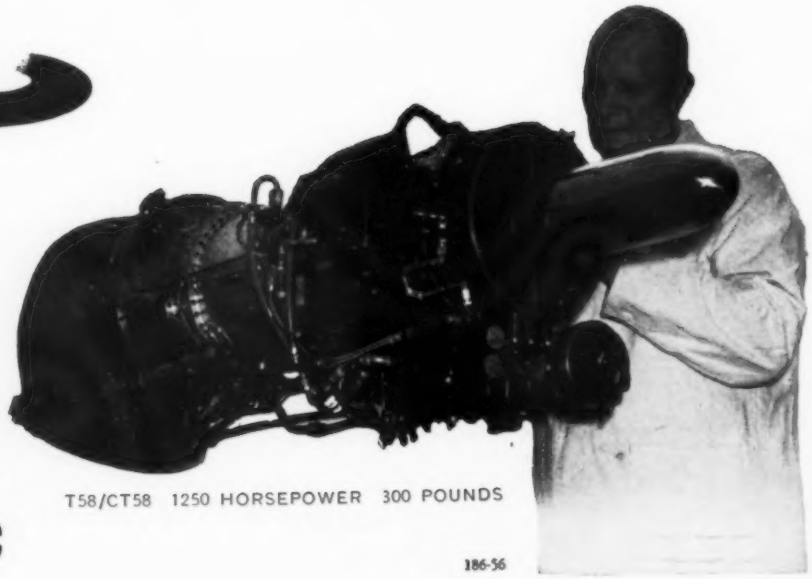
GENERAL ELECTRIC'S

T58

POWERS THEM ALL



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SMALL AIRCRAFT ENGINE DEPARTMENT

GENERAL ELECTRIC

FLIGHT PROPULSION DIVISION

AIR REPORT

SIGNIFICANT NEWS — TRENDS

AERO COMMANDER ANNOUNCES WEST COAST EXPANSION with the establishment of an additional engineering facility in Santa Monica, Calif. Quarters will include 2,000 sq. ft. of floor space in the Lawrence Welk Union Bank Building to be used as an expansion of Aero's engineering on their new model 1121 Jet Commander. The company's main engineering operation is located at Westheimer Field in Norman, Okla.

ATLANTIC AVIATION IS THE TOP COLLINS RADIO DISTRIBUTOR for 1961 with a retail volume in excess of $1 million. The Wilmington, Delaware, division of Atlantic accounted for about 90% of the total sales.

AMERICAN AIRLINES CLAIMS TWO COMMERCIAL SPEED RECORDS, set by two of its Boeing 707-B jetliners. One of the planes streaked from San Francisco to New York in 4 hrs. 29 mins., at an average speed of 576.72 mph. The former mark for the New York run was 555.5, set by an Australian airline's 707. A second American Airlines 707 made good 597.6 mph. between San Francisco and Chicago, taking 3 hrs. 5 mins. If the San Francisco-New York City flight is certificated by the Federation Aeronautique Internationale, it will be the first international commercial record held by a U. S. airline.

KOLLSMAN INSTRUMENT, LOCKHEED AIRCRAFT FREED OF LIABILITY IN ELECTRA EAST RIVER CRASH by a Brooklyn Supreme Court Jury. The case was brought against Kollsman, maker of the Electra's altimeters, Lockheed, and American Airlines. Testimony from two surviving crew members, stating that the altimeters had misindicated at 500 ft., was rejected. The verdict found only American Airlines liable to the three plaintiffs, who were awarded $898,000 plus interest.

KAMAN H-43B HUSKIE HELICOPTER SETS THREE NEW WORLD RECORDS for rate-of-climb, and all in a single flight. The turbine-powered Air Force rescue craft climbed to 3,000 meters (9,842 ft.) in 2 min. 44.5 sec., to 6,000 meters (19,684 ft.) in 6 min. 42.3 sec., and soared to 9,000 meters (29,526 ft.) in 14 min. 11.5 sec. The Huskie also claims two altitude records — one of 32,279 ft., the other of 26,369 ft. for helicopters carrying a 1,000 kilogram payload.

VERTOL WILL BUILD ROTOR BLADE PLANT NEAR PHILADELPHIA with initial occupancy in mid-1962. The projected complex, to include an office building and service buildings, will total 351,000 sq. ft. and will supplement its 415,000 sq. ft. Morton, Pa., plant and its flight test center at Philadelphia International Airport. Vertol, a division of Boeing Aircraft, is presently building the Vertol 107 and the HC-1B Chinook twin-turbine transport helicopters.

FAA CONSIDERS MAKING FLIGHT RECORDERS MANDATORY on all non-airline turbine-

FLIGHT MAGAZINE

DECEMBER, 1961 VOL. 50, No. 12

THIS MONTH'S COVER presents an excellent hovering view of the Hughes 269-A two-place helicopter now in production at Culver City, California. With a cruising speed of 85 mph., the Hughes "compact" features a fully articulated rotor system with flexible blades and a ring-and-pinion transmission system which delivers power from the 180 hp. Lycoming engine to the rotor blades at a specific rpm. ratio. (See story on page 38)

Air Report—SIGNIFICANT TRENDS AND NEWS 5

Editorials—STRAIGHT TALK, WHAT'S AHEAD IN TRAFFIC CONTROL? 19

Interview with Clarence Belinn—LOS ANGELES AIRWAYS PRESIDENT ANSWERS QUESTIONS FROM FLIGHT MAGAZINE 35

They Said It Couldn't Be Done—SAN FRANCISCO & OAKLAND HELICOPTER AIRLINES 36

Helicopters for People—HUGHES 269-A 38

Growth Year for Helicopters—OPERATORS, MACHINES, INDUSTRY 40

Franklin Engine Production Is Revived—PIONEERING HELICOPTER ENGINE NAME REAPPEARS 42

New Turbine for Helicopters—AIRESEARCH ENGINE TESTED IN REPUBLIC LARK 47

First Details on $12,000 Musketeer—A FIXED-GEAR BEECHCRAFT FOR THE LOW-PRICE MARKET 58

Omni Breakthrough—DARE "SOLID STATE" OMNI HAS BATTERIES FOR EMERGENCY 61

Improved Piper Comanche 250 for 1962—BETTER FLAPS, "RUGGEDIZED" ENGINE, "PALM BEACH" INTERIOR 62

Four New Cessna Models—SKYLANE, MODEL 172, SKYHAWK, MODEL 150 64

Piper Sales Meeting—22ND ANNUAL 67

Needed: A Third Level of Air Service—BY E. H. PICKERING—PART V IN A SERIES 68

Scheduled Skyways' Ticket to Success—RAY ELLIS' LIGHTPLANE AIRLINE 69

Airmen's Calendar—COMING EVENTS 71

Marketing Pays for Narco—SUCCESS STORY OF NAV/COMM PRODUCER 72

Aztec B for '62—NEW ELONGATED NOSE GIVES INCREASED VERSATILITY 74

New Business in the Hangar—NATIONWIDE ROUNDUP OF INTERESTING DEVELOPMENTS IN BUSINESS FLYING 82

GEORGE E. HADDAWAY, Publisher; TOM ASHLEY, Executive Editor; E. H. PICKERING, Air Transport Editor; EDWARD L. DELOACH, JR., Special Features Editor; FRED N. STONES, JR., General Manager; LOUISE ROBERTSON, Circulation; P. O. Box 750 (2700 N. Haskell Ave.), Dallas, Texas — Telephone TAylor 3-6191.

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WITH THE NEW **SPARTAN BRAKE BOOSTER SYSTEM**

- No creeping on engine run-up
- Less effort for pilot
- Positive braking action
- Easy installation
- Total installation weight — 3 lbs.
- FAA-STC No. SA2-1191 — FMA approved

This great new system will fit Beech aircraft models TC-45H, C-45H, TC-45G, C-45G, G-16S, D-18S, E-18S.

SPECIAL NOTICE

The Spartan Brake Booster system can be completely installed in a normal operating brake system in one day.

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sparlan AIRCRAFT COMPANY / TEmple 5-4491 / Municipal Airport / Tulsa, Oklahoma

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ARC-Built • Crystal-Controlled • 14 or 28 Volts
Light Weight, 13.7 lbs. • Local-Controlled
Transmit 360 Channels • Receive 380 Channels
Marker Beacon Receiver* • TSO, Cat. B
Right for All Planes!

WRITE FOR FREE BROCHURE

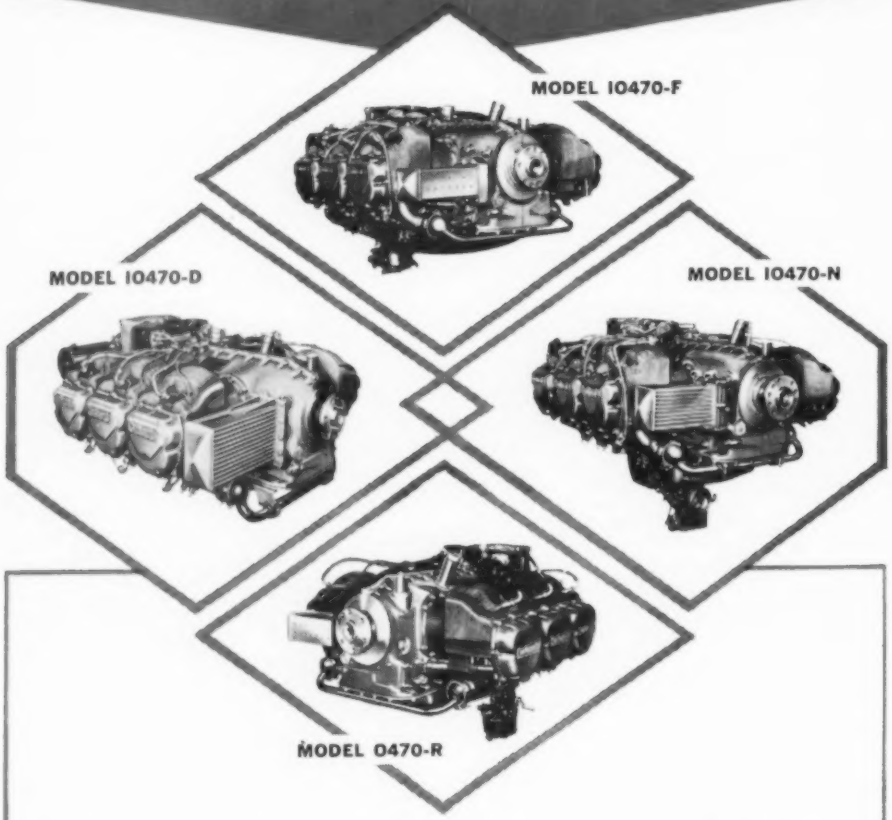
A complete system offering broad receiving and transmitting coverage of VOR, LOC and Communication Frequencies (Transmits 360 com channels, 118.0 to 135.95 mc, Receives 180 com channels 118.0 to 126.95 mc in 50 kc steps, plus all VOR and LOC frequencies from 108.0 to 117.9 mc in 100 kc steps). Separate receiver and transmitter controls mean flexibility in frequency selection. Designed to "stack" with compatible ARC gear in your instrument panel for a nav/com package second to none. See your ARC dealer now.

** Self-contained 3-light Marker Beacon Receiver, Optional*

Aircraft Radio Corporation
BOONTON, NEW JERSEY

Research, Design, Development and Production of Electronic Equipment since 1928

3 GOOD REASONS for Choosing a Plane with CONTINENTAL POWER



The preference for airplanes with Continental power rests on a solid three-point base:

❶ In few other products for man's use does the quality of dependability count for so much as in aircraft.

❷ Advanced engineering, precision manufacture, and rigid quality control have made Continental dependability a byword throughout the globe.

❸ Continental safeguards its product's good name, and its owners' satisfaction, with established parts and service facilities wherever people fly.

The men and machines that built your engine originally are best qualified to restore it to like-new condition. Continental's Factory Remanufacture backs you with factory knowhow, and precision production machinery, throughout your engine's life. Write for information.

Continental Motors Corporation
AIRCRAFT ENGINE DIVISION
MUSKEGON • MICHIGAN

powered aircraft weighing more than 12,500 lbs. and flying above 25,000 ft. The flight recorders, valuable in accident investigations and analysis of in-flight incidents, are presently required on airline airplanes in this category. If the proposed amendment is adopted, says the FAA, operators will have six months to install the recorders and will be under "more flexible" recorder maintenance and repair requirements than are the scheduled carriers.

$2,500,000 IN HELICOPTER TRANSMISSION ORDERS has been received by the Indiana Gear Works division of The Buehler Corp. from two helicopter manufacturers, Sikorsky of Stratford, Conn., and Hiller Aircraft, Palo Alto, Calif. The transmissions will be used in Sikorsky S-58 and S-62 helicopters and the Hiller H-23D helicopter.

TWO PROFESSIONAL PILOT TRAINING CENTERS ARE ESTABLISHED by Transport Flight Systems, Inc., at Minneapolis, Minn., and Cleveland, Ohio. The new centers, according to Transport Flight, "are geared to provide the same level of instruction that has characterized Transport Flight's FAA and Scheduled Airline Approved Training operations in Houston, Texas."

FAA REQUIRES 90-DAY NOTICE of anyone proposing to establish, alter, or deactivate a landing area, under the administration's new amendment to Part 625 of the regulations. Cases in which this notice need not be given are: Projects for which a request for federal aid has already been filed under the Federal Airport Act; military projects for areas used exclusively by the military; projects for one time or short term (not exceeding 30 days); use where aircraft operations will not exceed 10 a day, and projects involving privately-owned landing areas, not open to the public, located at least five miles from any other airport where civil or military instrument approach procedures are authorized.

AIR TRAFFIC CONTROLLERS HONOR SENATOR MIKE MONRONEY of Oklahoma with the ATCA's highest award, a bronze medallion, at the association's sixth annual meeting in Miami Beach. M/Sgt. Wallace E. Vaught was recognized as air traffic controller of the year, and the Chicago Air Route Traffic Control Center, as the ATC facility of the year. Ten other awards were given.

AIR-MINDED WICHITA BUSINESSMEN SPREAD THE GOOD WORD in a two-day air tour of eight Kansas, Oklahoma and Texas cities. A squadron of 14 business airplanes, loaded with Wichita businessmen, was gotten together by the Wichita Chamber of Commerce "to visit various communities in an effort to learn more about their assets and citizens . . ." It was the third year of the "Airmada" and was considered a suc-

cess this year, both as a good-will venture and as a demonstration of business airplane utility.

USAF ORDERS 144 MORE T-38 TALON SUPERSONIC JET TRAINERS from Northrop Corp., bringing the total number of T-38's ordered to 357. The T-38 flies at 850 mph., climbs to 55,000 ft., and is the first supersonic airplane designed specifically for pilot training. The airplane is now in service as the basic pilot trainer in the Air Force's new all-jet flight instruction program.

ROBERT S. SCOTT JOINS AIRWORK CORPORATION as sales-service manager of the company's Millville, New Jersey, Field Service and Engine group.

SUNAIR ELECTRONICS BUYS ASTRON ELECTRO-DYNAMICS CORPORATION of Hileah, Fla. Sunair, a company that manufactures aircraft radios, printed circuits and solid state devices, takes possession of the 10,000 sq. ft. Astron building, but reports it will retain the Astron staff.

MISS DOROTHY J. ANDERSON WINS "SMALL" WOMEN'S AIR RACE sponsored by the Michigan Chapter of the Ninety-Nines (women pilots) and entered by 42 airplanes, both single and twin engine. Named "small" to avoid confusion with the "big" All Women Transcontinental Air Race (Powder Puff Derby), the handicap race is in its sixth year and has attracted an average of 30 contestants each year. Trophies and prizes totaling $600 were awarded first through fifth place winners.

G. "BUSTER" SELLARS JOINS TIMMONS AVIATION OF MONTREAL and will serve as manager of Customer Relations. Sellars recently retired as Eastern Canadian Aviation manager for Shell Oil of Canada.

SOUTHERN AIRWAYS BUYS MARTIN 404's to supplement its fleet of 26 26-passenger DC-3's. The initial purchase of five Martins will be used to service Atlanta and Columbus, Ga.; Dothan, Huntsville and Muscle Shoals, Ala., and Fort Walton Beach and Panama City, Fla. The 404 seats 40 passengers, is pressurized, air-conditioned and radar-equipped.

A FREE COPY OF THE "PROS AND CONS OF LEASING" can be obtained by writing to the Foundation for Management Research, 121 West Adams St., Chicago 3, Ill. The pamphlet is revised and expanded to 24 pages, gives advice on renewals and options-to-buy at the end of the lease period, latest Internal Revenue Service rulings about write-offs on lease equipment, and analysis of specific lease situations.

TO PREVENT ICE FORMATION IN JET FUEL SYSTEMS, Dow Chemical Company, Midland, Mich., has made available a chemical additive that has already been proved by the USAF for use on SAC bombers

(Continued on page 24)

NEW!

DARE MINIATURE NAV SYSTEM

First Completely Transistorized Nav Unit

* Less than 0.2 amperes total current
5 pounds total weight
Meets TSO and FCC requirements

Here's the entire system for precise Omni-Loc navigation and VHF reception. Two handfuls of dependable transistorized circuitry do the whole job. No external power supplies, no extra black boxes. It's all here with nothing to add.

The DR-480 Receiver ... with its fast digital control provides coverage of 480 channels from 108.00 to 131.95 mc. So sensitive, a 5 microvolt signal will produce rated navigation and audio outputs. The standard instrument case is only 10⅝" deep installed behind your instrument panel. Automatic Glide Slope Channeling Control is already included. This receiver is also ideal for ferrying and emergency use, for it can be operated easily from a simple battery pack or any aircraft DC electrical system.

The DNCI-1 Converter-Indicator ... is all transistorized in one standard instrument case only 8⅝" deep installed. Full instrumentation to latest military design includes FPDI needles for VOR and GS, Flag Alarms for VOR, LOC and GS, as well as To/From indicator. Maximum bearing error is ± 2°.

The new Dare DTX-10 makes an ideal transmitting companion. Full 10 watts and more of transmitting power on 360 channels. Small, lightweight digital remote control. Ask your Dare dealer for full details.

DARE INC. - TROY, OHIO

Distributors at Principal Airports

Presenting Business Aviation's

ALL-AMERICAN LINE FOR '61-'62!

Corporate touchdowns are a cinch when pilots and plane owners have a line like this to clear their paths of trouble. • Stars in their own right long before they moved up under the banner of Service City USA, these specialized performers today comprise the winnin'est forward-wall in business aviation. • This is All-American teamwork at its experienced best.

This is Progress. This is . . .

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AT SOUTHWEST AIRMOTIVE, LOVE FIELD, DALLAS

SERVICE CITY *Gail:*
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★ Associated Radio Service Co.
★ Executive Aircraft Service, Inc.
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★ Southwest Airmotive Company
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They're Taking Over!

They weigh less than a ton, yet pack the working power of a bulldozer. Their ascent in the military is attested to by this remarkable fact: **by 1970 they will outnumber all other Army aircraft.*** They are penetrating the business front, expediting VIP travel, speeding critical material, impressing clients with the b-i-g look of plants and projects. This year, heads-up companies will spend $50 million with charter operators in the U.S. and Canada. To discover why the charter, lease or purchase of a helicopter is sound business for your company, contact the Hiller Commercial Division. Hiller—for two decades a pioneer in helicopter development, production and service.

*Estimated Army aircraft by 1970: 8,000.

HILLER
AIRCRAFT CORP.
PALO ALTO, CALIFORNIA
SUBSIDIARY OF THE ELECTRIC AUTOLITE COMPANY

*Mooney's rise to the top seller * in retractables is causing many plane buyers to take a closer look at Mooney for '62. Here is what they see . . . a new standard of quality craftsmanship inside and out. The beautifully styled interior is designed for long lasting comfort and utility. A new pilot-planned instrument panel affords extra safety and efficiency for all-weather flying. The Mark 21 hefts a bigger payload, has a new flap system, and a new exhaust for quieter cabin.*

For price, performance, comfort, safety, and utility . . . take a closer look at Mooney for '62. — Fly it and see!

Since June, Mooney sales have averaged over 33% of total sales in 4 place retractables.

Mooney has accomplished this outstanding sales record with more than 50% of the available sales territory open. Are you overlooking an opportunity? Write for additional information.

*Official Aircraft Sales (A.I.A.) Quarter Ending Oct. 31, 1961

Aircraft Model and Price*	Mooney Mark 21 $16,450	Comanche 180 $17,350	Comanche 250 $21,990	Beech Debonair $21,975	Cessna 210 $23,450	Beech Bonanza $26,500
Total Sales Aug.-Sept.-Oct. 1961	100	41	51	35	19	36
Percent of Total Sales	.35%	.15%	.18%	.12%	.07%	.13%

*Latest Advertised Price

MOONEY
aircraft, inc. *kerrville, texas*

LOOK WHAT'S HAPPENING TO FRANKLIN ENGINES

Under the new ownership of Aero Industries, a diversified aviation and missile component manufacturer, Franklin engines are flexing their muscles.

Continuing in amplified production is the magnificently successful Franklin 240 h.p. turbosupercharged engine which powers the Bell 47G-3 high altitude helicopter, latest in the long line of "Franklin Firsts."

Coming—very soon—are new "firsts," both for helicopters and fixed wing aircraft. Look for early certification of:

- New Franklin 260 h.p. geared engine with turbosupercharger and fuel injection.
- New Franklin 220 h.p. geared, naturally aspirated engine with optional fuel injection.
- New Franklin 185 h.p. direct drive, naturally aspirated engine in the 335 cu. in. series, for low octane fuel.

These new engines, all for fixed wing installation, will maintain the Franklin reputation for dependability, easy maintenance, light weight, and moderate cost. And they are only the beginning of the good things to come from Franklin Engine's revitalized management-engineering team.

From now on, watch Franklin for the "firsts" in light aircraft power.

Franklin
FINE AIRCRAFT ENGINES

FRANKLIN ENGINES, INC., SYRACUSE, N. Y.
A Subsidiary of Aero Industries, Inc.

OVERSEAS DIVISION
MONTGOMERY AERO INDUSTRIES CORP.
TIME & LIFE BUILDING, ROCKEFELLER CENTER
NEW YORK 20, NEW YORK

BOEING VERTOL 107'S

STEEL SPAR ROTOR BLADES

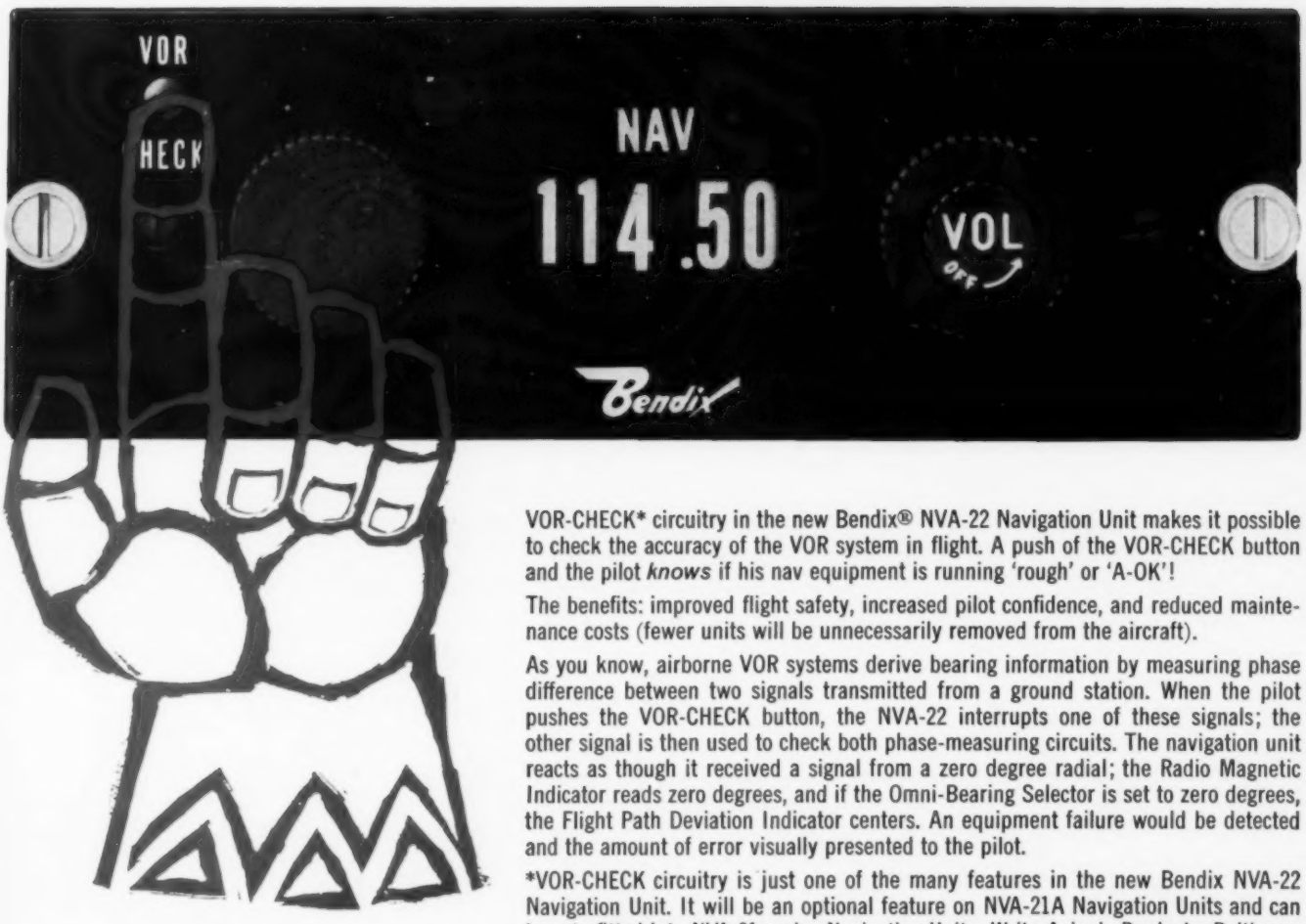
BUILT TO TAKE PUNISHMENT IN ANY ENVIRONMENT

The broad usefulness of the Boeing Vertol 107, world's only "mission module" helicopter, is augmented by rotor blades designed for dependable service in even the most unfavorable environments. With heat-treated steel D-spar forming the leading edge, Boeing Vertol rotor blades have good fatigue strength and great resistance to surface scratching and nicking. Steel loses little weight due to normal sand and rain erosion, thus Boeing Vertol rotor blades with hundreds of hours difference in service time can be used on the same rotor.

Proved thus far in more than 260,000 hours of accumulated service, the Boeing Vertol steel spar rotor blades have demonstrated excellent performance under difficult conditions in many places. Greenland, Labrador, Alaska, Northern Canada, the Sahara Desert and Far East jungle operation have proved the blades in a broad spectrum of temperature, erosion and corrosion environments. The steel spar rotor blades, incorporating latest state-of-the-art advances, are furnished as standard equipment on the versatile Boeing Vertol 107. They provide all-weather dependability and long life, with interchangeability that simplifies spares provisioning, maintenance and overhaul.

VERTOL DIVISION
MORTON PENNSYLVANIA
BOEING

CHECK YOUR VOR SIGNALS WITH BENDIX VOR-CHECK!



VOR-CHECK* circuitry in the new Bendix® NVA-22 Navigation Unit makes it possible to check the accuracy of the VOR system in flight. A push of the VOR-CHECK button and the pilot *knows* if his nav equipment is running 'rough' or 'A-OK'!

The benefits: improved flight safety, increased pilot confidence, and reduced maintenance costs (fewer units will be unnecessarily removed from the aircraft).

As you know, airborne VOR systems derive bearing information by measuring phase difference between two signals transmitted from a ground station. When the pilot pushes the VOR-CHECK button, the NVA-22 interrupts one of these signals; the other signal is then used to check both phase-measuring circuits. The navigation unit reacts as though it received a signal from a zero degree radial; the Radio Magnetic Indicator reads zero degrees, and if the Omni-Bearing Selector is set to zero degrees, the Flight Path Deviation Indicator centers. An equipment failure would be detected and the amount of error visually presented to the pilot.

*VOR-CHECK circuitry is just one of the many features in the new Bendix NVA-22 Navigation Unit. It will be an optional feature on NVA-21A Navigation Units and can be retrofitted into NVA-21 series Navigation Units. Write Avionic Products, Baltimore 4, Maryland.

Bendix Radio Division

THE Bendix CORPORATION

Make A Date Now To Meet

P35 Bo

You can step up to this new Beechcraft P35 Bonanza for far less than you may think (see below). It's the most distinctive, most comfortable Bonanza ever built— and easier than ever to fly—with a host of new features for 1962.

Unmatched comfort of Bonanza cabin is greater than ever with new Hydrolok reclining chairs, each fitted for headrest. Folding center arm rests. Rear seat accessory shelf.

Completely new instrument panel with radio heads slant mounted on their own separate panel for easier reading. Microphone mounted on exclusive center arm rest.

Deep-cushion, individual chairs are track-mounted. Exclusive Hydrolok control for reclining backs lets you choose exactly the right angle for utmost comfort.

Why
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The New Beechcraft

Bonanza

Partial Checklist of Important Extra-Value Bonanza Features:

- ✓ Greatest structural strength of any airplane in its field. So strong it's licensed in the Utility Category at full gross weight.
- ✓ Rugged wide-tread landing gear proven on more than 9,000 Beechcrafts. Electrically operated. No hydraulic gear problems.
- ✓ Fully enclosed wheel wells.
- ✓ 260 hp fuel injection engine for easy starting in any weather, precise fuel management, complete freedom from carburetor icing.
- ✓ Amazing fuel economy—uses less gasoline than most automobiles.
- ✓ Exclusive low-drag, low-weight V-tail for added efficiency.
- ✓ Interconnected controls for easy "steering wheel" flying.
- ✓ Throw-over control wheel.
- ✓ Aileron trim control.
- ✓ Largest, most comfortable cabin in its class—and the quietest.
- ✓ "Control tower" visibility that no competitor can match.
- ✓ Apartment-size heating system.
- ✓ Openable rear windows for easy ventilation on the ground.
- ✓ High stability wing tips for extra lift and low-speed stability.
- ✓ 270-pound baggage capacity.
- ✓ Big, fast-acting, electrically operated Fowler flaps for air-cushion landings and stable slow flight.
- ✓ Completely painted before assembly for extra protection against corrosion. Scientifically cured for longer life.
- ✓ Built as only Beech can build it, for long service life and amazingly low maintenance.

Why The Bonanza, With More Of Everything You Want, Costs You Less To Own And Fly:

The Bonanza has always been recognized as the strongest, best built, most efficient and most comfortable airplane in its field.

Yet, over the years, the Bonanza has been steadily improved in hundreds of ways—some big, some seemingly small—but all of them highly important to you.

And the new P35 Bonanza tops them all. Back of it is a design, engineering, and testing program unmatched by any single-engine business plane built today.

Because it's more airplane, the Bonanza does cost a little more to buy than other similarly-equipped airplanes in its class.

But when you consider extra tax savings, extra travel time saved, reduced maintenance costs, lower operating costs, and substantially higher resale value, the Bonanza actually costs you less to own and fly* than its competitors.

Your Beechcraft distributor or dealer can show you the figures. Before you buy any airplane, you owe it to yourself to see him.

*Based on normal 5-year investment.

Write today for ☐ Illustrated folder on the new P35 Bonanza. ☐ Easy, low-cost way to finance the Beechcraft of your choice. ☐ Beechcraft Leasing Plans. ☐ "Dollars and Sense of Business Flying." Address Public Relations Dept., Beech Aircraft Corp., Wichita 1, Kansas, U. S. A.

Beechcraft

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

SALUTE!

To Our Teammates on the Supply Line

CENTRAL FLYING SERVICE, INC., Municipal Airport, Little Rock, Arkansas

SALUTE! With 30 skilled employees and a fully-equipped 120′ x 200′ hangar large enough for Convairs, Central Flying Service is a versatile outfit geared for many business aviation tasks. The company was founded in 1939 by President Claud Holbert and, with a background of wartime civilian pilot training, continues with professional FAA-approved charter and school services. Also featured are sales, airframe maintenance and radio repair departments, all grades of Esso gasoline and 1-A turbo fuel. This prominent Southwest Airmotive supply customer offers many conveniences, including 123.0 unicom, rent cars, and a deluxe lounge.

SOUTHWESTERN SKYWAYS, INC., Coronado Airport, Albuquerque, New Mexico

SALUTE! This leader in New Mexico's winged land of sunshine is guided by Carl D. Ettinger, president, and is known as a top distributor of Cessna airplanes and the new Skyhook helicopter. Southwestern Skyways' snug, modern hangars are a welcome oasis for the visiting flyer, providing comfort, convenience, and the complete maintenance and overhaul of all types of aircraft. In addition to distributing Cessnas throughout New Mexico, the company also represents King, Motorola, ARC, Zep Aero, Continental, and others. For many additional items, Ettinger and his associates rely on the distribution division of Southwest Airmotive.

WEGNER AIRCRAFT, INC., Walker Field, Grand Junction, Colorado

SALUTE! Grand Junction is a crossroads in more than name alone. In the Rocky Mountain section of the nation, it is a focal point for the skytrails of business airplanes converging here to enjoy the all-out Western hospitality of Owner-Manager Don Wegner and his staff at Wegner Aircraft, Inc. Using numerous supplies furnished by Southwest Airmotive, Wegner operates a service facility regarded as tops in its area. Monarch Aviation occupies a portion of the Wegner hangar as a dealer in Cessna airplanes.

THE DISTRIBUTION DIVISION

Southwest Airmotive Company

Serving America's Heartland with Flying's Finest Supplies

SERVICE CITY U.S.A.

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EDITORIALS

Straight Talk

ONE of the healthiest signs in the lightplane industry as the year ends could well be the growing willingness of lightplane industry leadership to speak out clearly and in a straightforward manner on the problems they face, on their plans for the future and on their general philosophy, both business and development-wise. This trend toward speaking forthrightly instead of silence, of answering questions of the hour with blunt, direct answers instead of evasiveness, bodes well for the entire industry. We've been plagued too long with secrecy, with unsatisfactory interviews and with rumors which thrive in an atmosphere of ivory tower operations.

One could not attend recent annual sales meetings of the major lightplane companies without coming away feeling that men of stature are in control of destinies of the business we want to see prosper, whose products will become a more widely applied element in our national life, affecting more people.

One of the best examples was an address given last month in West Palm Beach, Florida, by Howard Piper, before some 800 Piper retail sales personnel.

"Pug" Piper made it crystal clear that his company was going to stay in the field it now serves and that it was not interested in higher-priced airplanes, corporate jet designs, helicopters or autogyros. While research and development would remain one of the most important elements of Piper's operations, they would restrict research to those projects that had about a 90 per cent chance of paying off. While Piper would continue to look for breakthroughs similar to its experimental molded fiberglass (polyester) two-place "Papoose" now being built in Florida, improvements in the present line of aircraft such as the new fore and aft baggage arrangement in the new Aztec and the 380-hp. Comanche would be the major goal. Citing the amazing flights of Max Conrad, who once carried 5,000 pounds of weight in a 180 Comanche, young Piper reviewed the many possible (but not probable) variations of the basic design ranging from the current 180 and 250-hp. models to the experiments with the 380-hp. engine, making a twin of it with two 160's, a single turbine-powered model of 500 hp. and perhaps even two small jet engines to make it a twin. A float model Comanche is definitely needed, he added. While they are not ready to make any definite announcements on the 380-400-hp. Lycoming powered Comanche (an 8-cylinder, ungeared, unsupercharged simple engine souped up to produce 400 hp. at 2,650 rpm.), he pointed out that it could carry 132 gallons of gas, a big payload, give excellent climbout and go 6 hours at 75 per cent power about "20 miles per hour faster than competition."

While full consideration would be given turbine power, he made the flat statement that turboprops and jets were not practical for Piper "for many years to come." "If and when we can pressurize cabins economically, then we will take advantage of turbine power. Meanwhile, turbine power and fuel consumption have to be cut to one-third present figures. Horsepower for horsepower, there is no speed advantage in the turboprops and the jets are even less efficient," he told the audience.

Commenting on their experiments with the vacuum-formed, reinforced polyester "Papoose" wing on display at the Florida meeting, Piper said that there must be some way to make airplanes for less money. He shocked the radio people with the announcement that Piper intends to push radio developments at Vero Beach, where they will soon produce a VHF transceiver and omni set, all in one box, to sell for around $600. At Lock Haven, the company has just spent a million dollars in new engineering facilities where no stone will be left unturned to produce constantly-improved airplanes for less money.

When he announced that the improved '62 models of the Apache and the Aztec would see no price increase, the applause was deafening. In that announcement was proof that Piper means what its executives say in holding the price line and constantly working for better products at low cost.

With competition getting tougher and tougher in the lightplane field, it would appear reasonable to assume that both today's and tomorrow's customer is going to get value received no matter what he buys. From the 1961 annual sales meetings it is apparent that at last the customer is king and millions upon millions of dollars are being appropriated annually by our manufacturers to provide him with the finest transportation money can buy. All we need now

to complete the success story is to find ways and means to substantially increase sales. Let no one doubt we have the product line. More "straight talk" from the industry to the customer and prospects will help.

What's Ahead In Traffic Control?

THE long-awaited Project Beacon Report on air traffic control has been released by the Federal Aviation Agency. This report is important to every airman because its recommendations will materially affect the kind of airways system and traffic control environment we fly in for years to come.

Even before it was released, the FAA moved to implement the report by establishing intra-agency organization last month under Joseph D. Blatt, who has the responsibility of getting the show on the road. Every segment of the FAA will be involved with implementation from administrative and budget people on through the operational, technical and research branches of the agency.

The task force, composed of recognized authorities from both industry and government, including the military, was headed by Richard R. Hough, American Telephone and Telegraph Company vice president (engineering), who fortunately pilots his own airplane.

Here are the major Beacon proposals of importance to pilots:

All air traffic over 24,000 feet in mountainous areas and above 14,500 feet in the rest of the country should be under positive control. On certain heavily-traveled airways, complete control would extend down to 8,000 feet.

A new category of flight known as Controlled Visual Rules (CVR) for pilots without instrument flight tickets should be established to permit positive control of certain VFR operations, primarily to provide safe traffic separation. This simply means a VFR pilot enters the control system but maintains position and course by reference to the ground. CVR would reduce visibility minimums since it removes the see-and-be-seen method of collision avoidance.

In very heavily congested areas, special arrival and departure "ramps" would be established in the congested airspace according to aircraft types and speeds. Speed limits should be established at high-density airports and aircraft segregated according to speed category.

For aircraft passing through (and not stopping) high density areas, special corridors or "tunnels" would be designated for separation of through VFR traffic from the landing and departing traffic.

Radars of the military SAGE system should be employed to augment the FAA radar network if necessary, but SAGE should remain primarily military and the goal should be to improve, modify and perfect the present system rather than mixing air defense requirements with civil traffic.

Helicopters should be given special express routes in high-density areas.

Since 3-D radar is not in existence or in sight for the indefinite future, aircraft must install altitude reporting transponders. All aircraft above 12,500-pound gross weight will be required to install such equipment on a time schedule and all aircraft under this weight classification flying into high-density airports would eventually be required to install it. The task force stated that a $500 beacon transponder for the smaller craft is feasible (qualified aircraft radio technicians do not agree that this is possible—Ed.).

Within the heavily congested terminal areas, all aircraft landing at controlled airports would be required to contact approach control at specified distances from the field.

In order to reduce radio transmissions and cut conversation, the ideal goal is to achieve a control system completely independent of navigation information from pilots. More extensive use of radar, along with the proposed transponders, would provide position information and materially reduce pilot-controller messages.

Likewise, use of general-purpose computers was recommended for both en route and terminal control operations to process flight plans, issue clearances, investigate conflicts, produce display information, establish landing sequences and perform other routine control tasks.

The task force estimates that the system proposed would cost about $500 million over the five years required to implement the major recommendations. This is double the cost of the present five-year FAA program. The group believes that the present $65 million a year budget for research and development is adequate.

In other areas the report emphasized the importance of airports and improved weather reporting on any move to improve air traffic control. By 1970, for example, some 50 airports will be overloaded as against 14 as of the present.

The report also pointed out that the present VHF-DME system looks adequate for many years to come, except in high-density and overcrowded areas, which will demand a more precise system of navigation and control. This, say the experts, will come from constant study, revision and applied research.

CESSNA ANNIVERSARY FLEET

The new Anniversary Model CESSNA SKYHOOK

Simplified Cessna rotor head

Full 360° omni-vision

Spacious cabin for stretch-out comfort

All-metal rotor blades

All-metal, stressed-skin construction

Advanced heating and de-fogging systems—standard equipment

Spacious baggage facilities

Wide doors for easy entrance

Rugged landing gear

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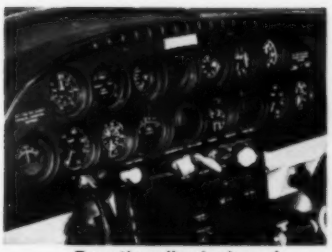

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Big pneumatic tires for easy ground handling

A remarkable new aircraft that brings you the versatility of rotary-wing flight, the stability of fixed-wing flight, plus the solid local support of Cessna world-wide dealer service.

NOW SEE ALL THE ANNIVERSARY FEATURES OF THIS GREAT NEW AIRCRAFT. SEE YOUR CESSNA DEALER. OR FOR FURTHER INFORMATION, WRITE: CESSNA AIRCRAFT COMPANY

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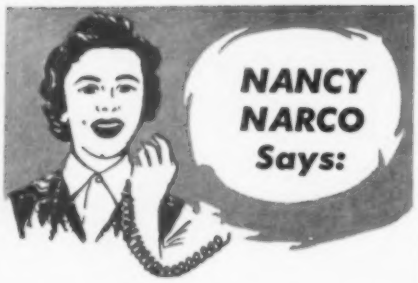

COMMUNICATIONS CLARIFIED

With all the talk about 360 channels and 50 kc spacing, this communications business sounds mighty confusing to the average pilot. Actually, for normal VFR flying you can get along with just two transmitting frequencies (122.1 en route and 122.5 for most towers) and nine will take care of almost any VFR situation.

Here's a quick run-down:

1. *To Talk to Towers.* Talk on 122.5 mc, listen on the specific tower frequency — shown in the printed box on Sectional Charts as the first blue number after data on airport elevation and runway length. (Note: where several tower-controlled airports are nearby, some guard 122.6 or 122.7 instead of 122.5, but this occurs only in major terminal areas.)

Or, you can talk to the tower Simplex fashion, transmit on the same frequency as you receive—recommended procedure.

2. *On the Ground.* If you have it, talk and listen to Ground Control on 121.9 (occasionally 121.7 when several airports are close by) until you're ready for take-off.

3. *En Route.* To call an FAA Flight Service Station (FSS) use 122.1. They can talk on the Omni or LF radio range or on 122.2 if you so request. (In Canada you can use 122.2 Simplex —talk and listen.) You can also work FSS stations on 126.7 Simplex. When calling FSS, always tell them which frequency you are listening on for their reply.

4. *Emergency.* A" ground stations guard and can talk on 121.5.

5. *Unicom.* Use 122.8 talking to airports without towers; 123.0 for airports with control towers.

If you'd like a placard for your instrument panel, listing these basic frequencies and their functions, Narco has a handy sticky-backed one for you, free. Either see your Narco distributor or write to me.

Regards,

Nancy

NARCO • Fort Washington, Pa.

YEARS AHEAD IN CONCEPT AND USEFULNESS

360-CHANNEL VHF TRANSCEIVER
with 50 kc spacing 118.00 — 135.95 mc

190-CHANNEL
COMM/NAV RECEIVER
108.0 — 126.9 mc

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MARK 10

The Narco Mark 10 packs more communications and navigation service per square inch on panel space than any COMM/NAV radio ever produced. In a single "Mark-size" unit, the Mark 10 gives you all-channel capability — 50 kc spacing right up to 135.95 mc — with fast, positive, single-action crystal tuning of both transmitter and receiver.

For simultaneous navigation or supplemental communications reception below 126.9 mc, the Mark 10 also provides a separate 190-channel crystal-controlled receiver covering the entire NAV band (VOR and ILS/LOC) plus all tower, approach and departure radar control and most IFR channels. With a Narco CS/VOA-3 converter attached, VOR and ILS/LOC navigation is provided.

If you're buying a new airplane, plan your radio system with the Mark 10 as your basic multi-purpose equipment. It's the perfect foundation of a 2½ system now or later. Or, for your present airplane consider a Mark 10 to cut weight, save panel space, increase your COMM/NAV capability.

- Weighs only 12 lbs. (6 lb. panel unit; 6 lb. remote unit).
- 6 to 8 watts transmitter output.
- 8 watts audio output. Can serve also as speaker amplifier for 3 other units.
- Comm Receiver incorporates squelch feature, adjustable from 5 — 25 microvolts.
- Export model available with frequency range from 117.0 to 135.95 mc.
- Thoroughly engineered and backed by Narco's exclusive Warranty Program.

NEW! *"What Radio System's Best for You?" Just off the press — free booklet describing various radio combinations and systems. See your Narco distributor or send for your free copy.*

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See your Narco distributor or write for Mark 10 brochure.

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NATIONAL AERONAUTICAL CORP., FORT WASHINGTON, PA.

How Clean Is Your Fuel?

Even the most forgiving airplane can turn nasty if its gasoline diet gets contaminated with water, dirt particles and other non-combustibles. Perhaps you know and observe the precautions necessary to avoid fuel contamination in your plane. But, in the interest of safety, let's review the basics:

DRAIN FUEL SUMPS. Notice that plural: sumps. On your pre-flight, it pays to drain a few ounces, not only from the main gascolator, but from the wing tanks themselves. This gets rid of moisture and sediment that accumulates on the bottom of the tanks and does *not* get cleared out through the gascolator. (Quick-drains are now available as an accessory for most light planes that do not already have them.)

TOP YOUR TANKS. Make sure those tanks get filled *before* you put your plane away for the night. This will prevent condensation from forming on the inside walls of your tanks—the same type of moisture you often see on the *outside* of your plane early in the morning.

One more tip: use all your tanks. Avoid letting gasoline "sit" for month after month in an auxiliary tank. Keep your fuel "fresh."

Follow these rules and you'll help keep your plane's gasoline diet pure and healthy. Incidentally, you might be interested in knowing something about the systems your Gulf aviation dealer uses to insure delivery of absolutely clean Gulf aviation gasoline into your plane.

Notice another important plural: systems. That's because your Gulf aviation dealer has what amounts to *three systems* working in combination to keep the fuel pure. Here's how they operate:

WATER-LOCKING FOOT VALVE. This is a special safety device installed on the suction pipe in every Gulf aviation gasoline storage tank. The water-locking foot valve floats in water but not in gasoline. So, if any water were to get into the gasoline storage tank, bang! . . . the water-locking foot valve would immediately close off the suction pipe and nothing could be pumped until that water was drained off.

MICRONIC FILTRATION. This is Gulf's filtering system at the pump, and it's so effective it will screen out any solid particle down to 10 microns in size. And that's pretty small, because a micron is 39 *millionths* of an inch.

100 MESH NOZZLE SCREEN. Just in case anything should flake off inside the hose, there's a very fine mesh screen right at the nozzle. So, up to the very point at which Gulf aviation gasoline is delivered into your plane, it's being filtered, cleaned, purified.

Reassuring, too, to know that Gulf aviation gasoline is the finest quality you can buy, whether it be 80/87, 91/98 or 100/130. The same applies to Gulf's two aviation oils—Gulfpride Aviation Oil Series D, the detergent oil, and Gulf Aircraft Engine Oil, the straight mineral oil. So taxi up to the Gulf sign for clean, high quality aviation products.

GULF
AVIATION PRODUCTS

AIR REPORT

(Continued from page 9)

and has been tested successfully in military and commercial aircraft and in missiles using jet fuel. Operating under license from Phillips Petroleum, Dow will market the additive through the company's normal channels.

AIRWORK WILL DISTRIBUTE SOUTH WIND HEATERS to all states east of the Mississippi under an agreement with Stewart-Warner, South Wind Division. Airwork branches will stock and sell units and spare parts for the aircraft gasoline-burning heaters, which are factory installed on a wide variety of aircraft.

FIFTIETH ANNIVERSARY OF THE FIRST TRANSCONTINENTAL FLIGHT was recently celebrated in Pasadena, Calif., and sponsored by the Pasadena Squadron of the Air Force Association. A testimonial banquet honored Calbraith Perry Rodgers' epoch-making coast-to-coast flight of 1911.

QUALITRON AERO ELECTS A NEW BOARD OF DIRECTORS following the death of John F. Haussler, Jr., former president of the company. The new board consists of E. G. "Gene" Panissidi, president and chairman of the board, E. P. "Gene" King, vice-president, and Billie Blanscet, secretary-treasurer.

THE PROMISE OF RADAR as a positive control of aircraft, from the enroute system to runway touchdown, was advanced by Winford T. Higgins, former U. S. Navy Air Traffic Control officer at the Sixth Annual Air Traffic Control Association meeting recently. Higgins, now air traffic consultant and assistant to the marketing vice president of Intercontinental Electronics, said that waiting for the "ultimate" traffic control system is unnecessary if existing off-the-shelf radar equipment is used more effectively. He pointed to the military's successful and safe use of radar at lower approach minimums than ILS and noted a savings in money and cancelled flights that would be possible if radar was used as a positive directive control "as opposed to advisory service."

NEW OFFICERS FOR THE FLORIDA AERO CLUB are: president and air cruise director — Julian E. Johnson, vice president — Leonard Davidson, secretary-treasurer—Marie Dillin. The Florida organization, one of the largest aero clubs in the country, has nineteen chapters, with approximately 900 members.

ARC APPOINTS ITS FIRST DIRECT FACTORY DEALER OUTSIDE THE U. S. as a part of the radio manufacturer's world-wide expansion. Thor Solberg Aviation of Oslo, Norway, is the new dealer, a firm made up of three companies abroad with five facilities in Norway, Sweden, Finland and Iceland.

A ONE-YEAR CORRESPONDENCE COURSE FOR PILOTS is now available through Transport Flight Systems, Inc., 8124 Lockheed, Houston 32, Texas. The course, which is divided into 12 study segments, includes such subjects as: C.A.R.'s, ILS and radar vectoring, multi-engine aircraft performance characteristics, emergency procedures and communication failures, weight and balance, and runway length requirements. Optional material is also available.

A. A. (TONY) LANSBARKIS, formerly Cessna Model 310 sales representative, has been appointed sales manager for Cessna's southwestern region, according to Richard N. Robinson, Cessna domestic sales manager.

WILLIAM S. LEWIS of Dallas, who held the patents on the Mitchell Autopilot, which he developed in 1954, died on November 15 after an illness. A member of National Pilots Association and the Texas Private Fliers Association, Lewis was a Navy pilot during World War II. He was a consultant to Mitchell on autopilot production as well as development.

WILLIAM G. KELLEY has been elected a member of the Board of Directors and Vice President, Marketing, for King Radio Corporation of Olathe, Kansas.

Give yourself a Bird's-eye view

Give yourself a bird's-eye view of your operations...whether inspecting job sites, ranching, or covering your sales area... with a Brantly B-2 helicopter. You have more leisure time, too, and can use it to better advantage. At $19,950, the Brantly B-2 is the lowest price helicopter on the market today.

CHOICE DISTRIBUTORSHIPS AVAILABLE...FOR COMPLETE INFORMATION, WRITE:

Factory & General Sales Office
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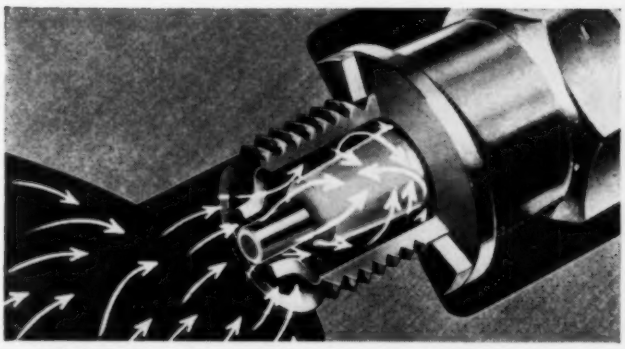
Brantly
HELICOPTER CORPORATION

If you spot your Beechcraft, Cessna or Piper listed below . . .

Here's what Champion's new foul-resistant spark plugs can do for you... on the ground and in the air!



Cutaway shows how blast of combustion gases is used more effectively for self-cleaning action.

On the ground . . . during long, frequent periods of engine idle, these new Champions prevent accumulation of fouling deposits that would form on ordinary plugs! Champion's redesigned firing end makes the difference. Incorporating a new *two-prong* electrode, larger bore and longer core nose, this "opened up" design permits greater entry and circulation of combustion gases—which blast away any fouling matter.

And this effective self-cleaning action promotes other important advantages: far less RPM drop during magneto check, virtual elimination of burn-out, and fewer spark plug replacements! One half fewer, even one third fewer—that's what operators across the country are reporting!

And in the air, too . . . the foul-resistant design of these new Champions continues to assure *smooth* engine performance—even over long-distance flights where deposits could build up on other spark plugs.

So equip *your* aircraft with new foul-resistant Champions today! Start enjoying the extra performance-advantages and extra hours of full-firing service these new spark plugs deliver. Approved for all popular aircraft, they are available in EM42E, REM40E and REM38E for short reach $\frac{5}{8}$-24 applications; and ALL-WEATHER RHM40E and RHM38E. Available for long reach $\frac{3}{4}$-20 installations are RHB37E, RHB32E and RHB29E.

Here are the Beechcraft, Cessna and Piper models for which new foul-resistant Champion types are available . . .

BEECHCRAFT

Model 18S	Twin Bonanza,	Debonair
Bonanza,	all models	33,A33
all models	Travel Air 95	Queen Air 65
		Baron 55

CESSNA

170-A, B,	175-A	195
Skyhawk	180 C&D	210
172-A, Skylark	185, Skywagon	310, C, F
	182, Skylane	

PIPER

Cub	Tri-Pacer	Aztec "250"
Super Cub	"135," "150,"	Comanche
"105," "125,"	"160"	"180," "250"
"135," "150"	Apache	Cherokee
Pacer "115,"	"150," "160"	Pawnee "150"
"125," "135"		Colt "108"

Note: *If your aircraft is not listed above—check with your dealer to see if yours is one of the many other models of aircraft that can be equipped with Champion's new foul-resistant spark plugs.*

DEPENDABLE
CHAMPION
SPARK PLUGS

CHAMPION SPARK PLUG COMPANY
TOLEDO 1, OHIO

Announcing The New Beechcraft

With speeds up to 236 mph, the new Beechcraft Baron can carry 5 people, has capacity for 540 pounds of baggage. Optimum range, with reserve, over 1,200 miles.

At The Altitudes You Fly Most, The New Baron Carries More, Carries It Faster, Farther—For Less:

At typical cruise altitudes, no other 5-place twin can carry so much payload, fuel and equipment so far so fast—and at such low cost—as the new Beechcraft Baron.

Here is the big, rugged twin that gives you the high performance and low operating costs you've always wanted. And you don't have to fly at oxygen altitudes to get it. Yet, because it's so aerodynamically "clean", the Baron squeezes more miles out of every gallon of fuel than any of its competitors. Even IFR, you can carry fuel for over 1,000 miles of flying, plus reserve, and still have a 5-place airplane.

The Baron is amazingly easy to handle. You don't have to be a superman to fly it. And it's almost unbelievably quiet inside for a twin of such high performance. The new instrument panel is a pilot's dream, and all controls and switches are located for simple, easy operation. Pilot visibility is unequalled. You owe it to yourself to fly the Baron before you buy any twin.

Study the chart at the right, then see your Beechcraft distributor or dealer for a demonstration flight. Once you fly this sensational airplane, we know that you, too, will want to step up to a Beechcraft Baron.

A55 Baron

America's Fastest-Selling Twin In 1961 . . . By Far Today's Biggest Twin Value:

Now the airplane that surprised the aviation world with sensational new speed, range and operating economy is even newer and better than ever. A wide range of new standard and optional features include:

- **New quiet** with new super-soundproofing, plus new exhaust stacks that direct engine noise outward away from the cabin.
- **New custom tailored interiors.**
- **Extra baggage compartment in nose.**
- **Openable center cabin windows.**
- **New center-mounting for microphone.**
- **Deep cushioned Hydrolok reclining chairs.**
- **Wide choice of new custom radio installations.**
- **Many others!**

Your Beechcraft distributor or dealer can give you the details. See him soon!

Write today for new illustrated folder on the Beechcraft Baron. Address Public Relations Dept., Beech Aircraft Corp., Wichita 1, Kansas, U. S. A.

Beechcraft

AIR FLEET OF AMERICAN BUSINESS

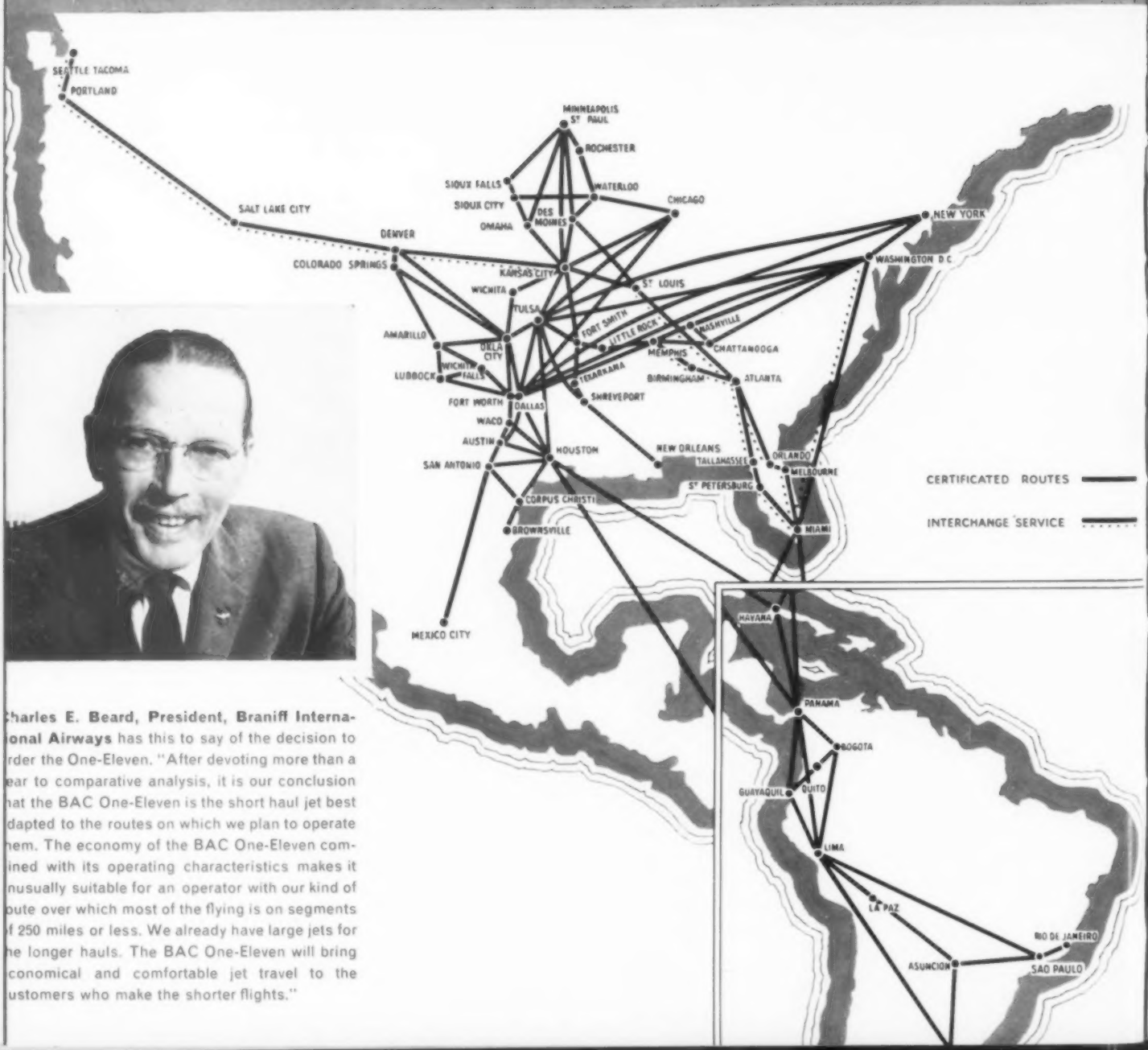
	Beechcraft Baron	Cessna Skyknight
Standard Price	$58,950	$69,950
No. of Seats	4-5	4-5
Useful Load	1,920 lbs.	1,800 lbs.
Usable Fuel (Std.) (Aux.)	112 gals. 140 gals.	100 gals. 130 gals.
Payload with Full Aux. Fuel	1,023 lbs.	957 lbs.
Cruise and Fuel Consumption at Max. Rec. Power Settings:		
At 7,000′	75%...225 mph 27.6 gph	75%...215 mph 28.2 gph
At 10,000′	65%...220 mph 23.5 gph	65%...209 mph 24.4 gph
At 10,000′	65%...220 mph 23.5 gph	75%...221 mph 28.2 gph
Range (No Reserve) at Max. Rec. Power Settings:		
At 7,000′	75%...1,140 mi. 27.6 gph	75%...990 mi. 28.2 gph
At 10,000′	65%...1,310 mi. 23.5 gph	65%...1,113 mi. 24.4 gph
At 10,000′	65%...1,310 mi. 23.5 gph	75%...1,020 mi. 28.2 gph

Figures from manufacturers' literature and other published authoritative sources.)

Now easier than ever to fly. All flight instruments now shock mounted in separate panel in front of pilot and functionally grouped for fast, easy reference. Removable as a unit. Radios now centrally stack-mounted for easier, simpler operation. Microphone now in center arm rest for added convenience.

BRANIFF *International* AIRWAYS

Charles E. Beard, President, Braniff International Airways has this to say of the decision to order the One-Eleven. "After devoting more than a year to comparative analysis, it is our conclusion that the BAC One-Eleven is the short haul jet best adapted to the routes on which we plan to operate them. The economy of the BAC One-Eleven combined with its operating characteristics makes it unusually suitable for an operator with our kind of route over which most of the flying is on segments of 250 miles or less. We already have large jets for the longer hauls. The BAC One-Eleven will bring economical and comfortable jet travel to the customers who make the shorter flights."



CHOOSES

BAC ONE-ELEVEN

THE SHORT HAUL JET

BAC ONE-ELEVEN

TWO ROLLS-ROYCE SPEY TURBOFAN ENGINES

THE SHORT HAUL JET

WITH EVEN BETTER THAN VISCOUNT ECONOMICS

BRITISH AIRCRAFT CORPORATION

ONE HUNDRED PALL MALL LONDON SW1 ENGLAND

USA: BRITISH AIRCRAFT CORPORATION (USA) INC.,
399 JEFFERSON DAVIS HIGHWAY, ARLINGTON, VIRGINIA

NEW 1962 COMA

gives you the most room...comfort...rang
stability...safety...visibility...plus lamina
added strength and stamina. Eye-catching

TWO EXCITING NEW '62 COMANCHES! . . . Comanche 250 with new slotted Max-Lift electric flaps for quicker take-off, short landings; new optional fuel injection. New plush cabin, new luxury appointments.

Best all around, best by far, in the high performance 250/260 hp field.

Amazingly low cost Comanche 180, world record-proven leader in efficiency which means economy **plus** for you.

See your Piper dealer or write for 1962 Comanche literature, Dept. F-12. You'll quickly see that you belong in a Comanche.

PIPER AIRCRAFT CORPORATION, Lock Haven, Pa.

ANCHE

nge...performance and flying ease. Low wing
ina flow efficiency with deep spar design for
ing beauty, pocketbook-pleasing economy, too.

Attractive lease and finance plans available.

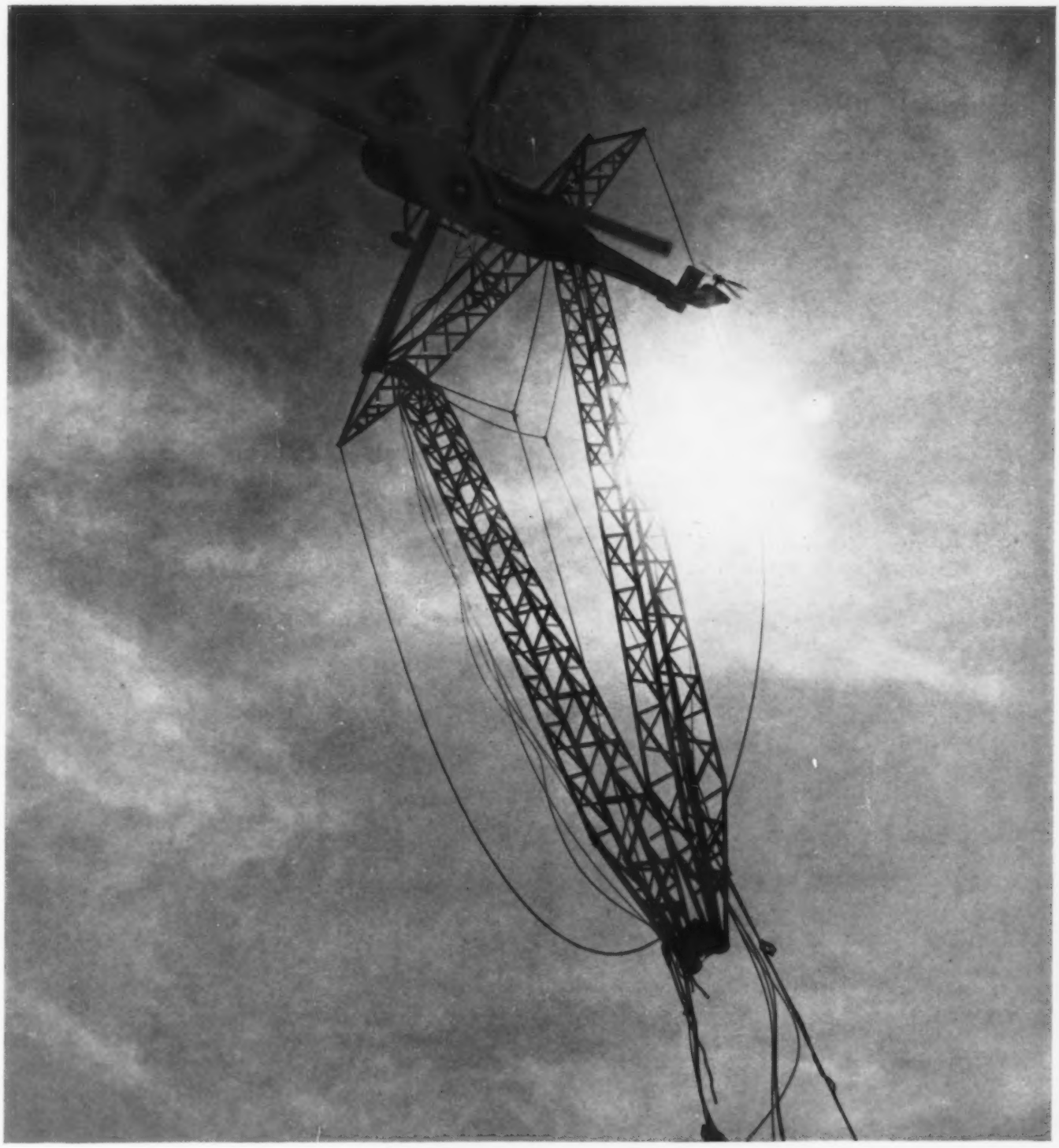
Business doesn't wait for sunny days...

There's no need to delay important trips when you fly Aero Commander. Take off today and fly over-the-weather in pressurized comfort.* The Aero Commander carries a full complement of electronic communication and navigation equipment for IFR operation, even radar. You'll find Aero Commander more profitable because it's capable of full-time utilization. Take off today in the stable, dependable Aero Commander.

**Cabin pressurization available on model 680F.*

AERO COMMANDER *offers the best combination of features essential to business flying.*

AERO COMMANDER, INC, Bethany, Oklahoma • Subsidiary of ROCKWELL-STANDARD CORPORATION



Short cut.

We carried the aluminum tower for nearly a mile. Then we eased down, holding it suspended near the ground while it was bolted and guy-wired into place. We released the hook and the tower stood on its own footings ready to be strung with power lines. From the air, we had opened a quick and easy route to tower-setting—eliminating road-building, trucks, and cranes...

The Sikorsky helicopter is replacing many things today. It speeds jet travelers between airport, city, and suburbs. It trucks cargo for industry. The armed forces fly the helicopter as a troop-transport, cargo-carrier and weapon. And people on-the-go in business and government use it as a company car. The Sikorsky helicopter works around the world. The helicopter is a truck is a bus is a crane is a company car. For an exciting story, send for "The Miracle of the Helicopter."

UA

SIKORSKY AIRCRAFT DIVISION OF UNITED AIRCRAFT CORPORATION

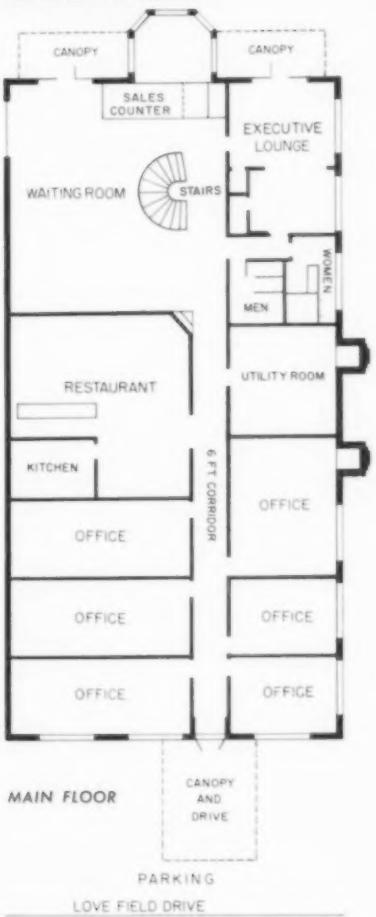
DALLAS AERO SERVICE

EXTENDS A CORDIAL WELCOME TO THE COMMERCIAL HELICOPTER OPERATORS ATTENDING THE HELICOPTER ASSOCIATION OF AMERICA ANNUAL MEETING IN DALLAS

January 21-24, 1962

WE ALSO INVITE YOU TO VISIT THE NEW FACILITIES OF DALLAS AERO SERVICE

At **DALLAS AERO SERVICE,** you can come in and relax in complete comfort. Our recently added Executive Lounge is just for that purpose. We are also making several other significant changes, such as the addition of available office space, in line with our program of expansion.



We offer you the following services for aircraft maintenance and overhaul:

1. **AIRFRAME:** A complete staff of trained personnel, experienced in single engine, light twin, medium-to-heavy twin and other multi-engine aircraft.
2. **ENGINE OVERHAUL:** Custom handling for your engine; all parts remain together when possible.
3. **PROPELLER:** Overhaul, balance, repair and refinish.
4. **INSTRUMENTS:** Class 1 and 2. No limitations. Exchange units available to cut downtime.
5. **RADIO:** Complete installation, engineered and approved.
6. **ELECTRICAL:** Complete rewire, overhaul and maintenance facilities.
7. **INTERIORS AND EXTERIORS:** Specialists design, build and install custom interiors . . . repair, repaint, refurbish interior and exterior.
8. **ENGINEERING:** Graduate engineer supervises alteration procedures and obtains FAA approval.

DALLAS AERO SERVICE

Henry L. Seale, President

3300 LOVE FIELD DRIVE • PHONE FL 2-2641 • DALLAS 35, TEXAS

COMPLETE ONE-STOP SERVICE ON CONVENIENT LOVE FIELD

Los Angeles Airways has four 28-passenger Sikorsky S-61's, such as the one pictured above, plans to order a fifth shortly. The twin-turbine helicopter has a useful load of 8,125 lbs., cruises 141 mph.

FLIGHT MAGAZINE INTERVIEWS

Clarence Belinn

PRESIDENT, LOS ANGELES AIRWAYS

CLARENCE BELINN

1. What is the significance of Los Angeles Airways' acquisition of 4 new twin-engine turbine-powered Model 61, 28-passenger Sikorskys?

These S-61's mean that we've become a legitimate airline for the first time in our 14 years of scheduled helicopter operations. Up until now we've had nothing to sell. We've been operating single-engine craft over unlighted airways. People flew with us because they *had* to. They will fly now because they *want* to.

The S-61's give us 100 per cent all-weather flying capabality, increased safety and flight dependability, 50% greater speed, increased comfort and reduced operating costs, to say nothing of a 10-fold increase in passenger-carrying capacity. There are many other advantages. The noise level of an 1,250-hp. turbine powerplant is about one-third that of a piston engine of the same horsepower. This pays off in passenger comfort and less outside noise. The safety and dependability of twin-engine equipment means the construction of more heliports, particularly on roof-tops. Most important of all, however, is the very definite promise of more service for less subsidy. Our routes can be extended for service to heretofore untapped markets in our area.

2. Speaking of subsidy, do you think the three "grandfather" helicopter airlines can live with the reduced subsidy allotments of approximately $6 million for fiscal '62 and the 2½ per cent reduction predicted for 1963?

Absolutely, yes. Here again the new turbo-copters are the payoff. We're expecting a ten-fold increase in passengers, and major gains in mail, express and freight. We'll probably order a fifth S-61 shortly, without benefit of the government loan guarantee. Five machines would permit us to carry as many as one million passengers annually. It doesn't take an expert to figure what this would mean in reduced subsidy costs.

3. What are your plans for expansion?

We can start immediately with service to Pasadena, downtown Los Angeles, Newport Beach and Catalina. We have on file with the CAB an application to extend our routes to 37 new points, including such well-known traffic generating stations as San Diego, Edwards Air Force Base, Santa Barbara, Barstow, La Jolla and Lake Arrowhead, plus a number of military centers in the Southern California area.

Everybody knows that California will soon have the largest population of any state and that freeways are not the major answer to the commuter problem. Recent forecasts by competent authorities pick the helicopter *and* the freeways as the solution.

Today the Greater Los Angeles Area is comprised of some three hundred cities and communities. It embraces an area of five thousand square miles, with a population of around 8 million people. This adds up to the biggest traffic headache of all time. We can't move underground. Our transport speed on the ground gets three miles per hour slower every year. A monorail between any two points would cost about $2 million dollars per mile.

The helicopter is the only vehicle possessing the unique capability of solving the transportation problem of such traffic conjested areas because it needs neither airport nor highway. One reliable forecast shows that by 1982 helicopters might carry as many as 20 million passengers a year in the Los Angeles "megalopolis."

4. If the helicopter needs neither airport nor highway, why is it that most helicopter services operate from airports?

Here again the new equipment is the answer to an age-old dilemma. The helicopter should not be only an airport-to-airport conveyance. Now that twin-engine turbo-copters with all-weather capability are available, we can expect real progress in breaking away from the airport as the major traffic generating point. Your magazine recently published an excellent story on Los Angeles Airways and explained

(Continued on page 48)

Choice Boarding gate front and center at San Francisco International Airport keeps San Francisco & Oakland Helicopter Airlines' operation always in the public eye.

FARES, MILES, FLYING TIMES AND PASSENGER MILE YIELDS FOR SFO'S OPERATION

Between:	Regular Fare	Flying Time: Minutes	Miles	Yield per Passenger Mile
San Francisco Airport-Oakland Airport	$7.50[1]	8	12	$.63
San Francisco Airport-Berkeley	8.50[2]	12	19	.45
San Francisco Airport-Downtown San Francisco	6.50[2]	8	12	.54
San Francisco Airport-Downtown Oakland	7.50[2]	9	14½	.52
Downtown San Francisco-Oakland Airport	7.50	6	10½	.72
Downtown San Francisco-Downtown Oakland	6.50	5	7	.93
Downtown San Francisco-Berkeley	7.50	5	9	.83
Oakland Airport-Berkeley	7.50	6	10	.75
Oakland Airport-Downtown Oakland	4.00	4	5½	.73
Downtown Oakland-Berkeley	4.00	4	5	.80

[1] The passenger pays no fare for this service when traveling American, Delta, National, or TWA.
[2] The passenger pays only from $1.25 to $5.00 for these services, depending upon individual agreements between SFO and the airlines, when traveling American, Delta, National, or TWA.

They Sa... It Coul...

By E. H. PICKERING

THEY said nobody could do it. They may have to eat those words — those people in industry, government and the airlines who believe that helicopter airlines can not be operated without subsidy.

Out in the San Francisco Bay Area a scheduled helicopter airline *has* been operating for six months without subsidy. Its name is San Francisco and Oakland Helicopter Airlines, Inc. — known as SFO — and before the end of its first year it expects to be operating in the black.

Let it be clearly stated that SFO's anticipated success does not necessarily foretell a new era of wide-spread subsidy-free helicopter airlines. To be certain of such results, another such airline would need the three major ingredients that are the cause of SFO's fast pace: (1) an area with a great volume of airline traffic; (2) an area where natural barriers retard surface travel, and (3) a man like SFO's President Mike Bagan to organize and direct the company. All of these ingredients are essential, but lack of capable management could nullify the advantages of the other two items.

San Francisco has the necessary volume of airline passengers — about 13,000 a day in and out of International Airport. Very few major population centers have the bay and the mountains and the crowded bridges that slow up surface transportation in the Bay Area. These two factors permit SFO to schedule flights at frequent intervals and to charge high-yield, self-supporting fares while still remaining competitive with taxi fares.

The third ingredient — Mike Bagan — has a combination of experience and abilities even more rare than the Bay Area terrain. Bagan is an accountant and an attorney. He started his aviation career with the research department of Central Airlines, then went to the Civil Aeronautics Board as a legal counsel and trial attorney handling the most complex and bitterly fought case in the Board's history (the Non-sked Case) then became administrative assistant to a Board member. Prior to forming SFO, Bagan was vice president and assistant to the president of the Los Angeles Airways.

In addition to experience, Bagan has a way with people and with politics. Two indications of these abilities are found in the fact that four trunk airlines have already joined SFO in joint fares that save the passenger nearly half of his helicopter fare and again in SFO's seven-man board of directors that include the chairman of the United Republican Finance Committee for Marin County and the chairman of the Democratic State Central Committee.

Bagan's prior helicopter airline experience aided him in forcasting operating cost levels of $60,000 per month and then achieving levels of about $58,000. The forecast also called for break-even revenues at 40% load factors in nine months. SFO neared a 30% load factor midway in its sixth month. Any of three factors now hanging fire could assure reaching the break-even point right on schedule: addition of other trunk air-

Passengers board an SFO Sikorsky S-62 at the downtown San Francisco heliport. The heliport adjoins the World Trade Center in the Ferry Building, which is in the heart of the financial district. Convenient auto parking is available at all three heliports. Passengers appreciate this convenience (which costs only 25¢ a week at the Oakland Heliport).

lines to the joint-fare agreements, completion of an agreement with the Post Office Department for carriage of mail at non-subsidy rates (competitive bid), or receipt of a third helicopter now on order for January delivery, which will permit more services.

SFO is currently operating two 10-passenger Sikorsky S-62 turbocopters on lease from the factory with options to purchase. Seventy-two daily schedules among five heliports (two of them at the San Francisco and Oakland airports) covering an operating period from 5:30 a. m. until midnight bring helicopter utilization to nearly seven hours daily per unit.

Bagan says that if there is a single "key" to successful helicopter operations, that key would be frequency of service. Departures no less frequent than every 30 minutes on short hauls, and preferably every 20 minutes, must be achieved to fully penetrate the market and achieve the goal of automatic passenger dependence on the helicopter services.

An SFO S-62 settles down at the new and attractive Berkeley Heliport. All three heliports presently served by SFO are lighted for night operations, and are examples of the finest heliports in the country receiving airline service.

y Said ouldn't Be Done

Presently, SFO provides 750 daily seats and is approaching an average daily sale of 200 seats while aiming at the magic number of 300 for an in-the-black operation.

Detailed per-mile operating costs are kept under wraps by SFO. Bagan says, "We don't want to put out any figures that we may have to eat later. We'll wait until we have a year's operation under our belts."

An estimate of over-all per-mile costs can be computed from known information, however. SFO schedules call for flying about 40,000 miles per 30-day month after applying their September-October record of 97% schedule completion. Applying these miles to Bagan's reported nearly $60,000 per month expenses gives a figure of $1.50 per mile. This figure compares with $3.62 per mile experienced by the certificated helicopter airlines in the year ended March 31, 1961. However, this comparison should be somewhat tempered by the fact that the certificated airlines were then operating piston-engined helicopters as contrasted to SFO's turbine-powered aircraft. The comparison is still startling, despite this fact.

With passenger fares yielding from 40¢ to 90¢ per mile, it is easy to see how SFO figures that a 40% load factor will put them in the black. Even allowing for absorption of an increment of the fare reduction for joint fares plus some excursion fares with yields as low as 20¢, it would not take many passengers to generate an average $1.50 per mile.

SFO's excursion flights permit passengers to make a circle flight of the scenic Bay Area, visiting all heliports for a flat $10 fare. Passengers using this fare travel only when space is available (thus not interfering with full-fare passengers) and are granted stopover privileges at any point. If "bumped" at a heliport by a full-fare passenger, the excursion traveler seldom has to wait more than 30 minutes for the next helicopter.

Says Morton Cathro, travel editor of the *Oakland Tribune*, about SFO's excursion-fare circle-flights, "It's like the Top of the Mark with wings." At this rate, SFO's helicopters may be destined to become as important a tourist attraction as the cable cars, Fisherman's Wharf, Chinatown and the Golden Gate Bridge. In effect only a few months, the excursion fares are attracting from 10 to 20 takers on weekdays and 35 to 40 per day over the weekend.

Heaviest traffic flows are in and out of San Francisco's International Airport to and from Oakland Airport, downtown Oakland, and Berkeley. Each of these points now exchange an average of 40 to 50 passengers with the airport on week days. SFO expects these points to reach 100 passengers a day within six months.

Joint fare arrangements are now in

(Continued on page 48)

PRESIDENT AND ORGANIZER of the San Francisco & Oakland Helicopter Airlines, M. F. "Mike" Bagan, is flanked by his management team. Left to right are Bruce F. DeHaas, vice president-operations; John J. Cunningham, vice president-assistant to the president; Mr. Bagan; Roger E. Hall, director of traffic and sales, and Chester M. Schmidt, director of maintenance. All five men are experienced helicopter airline veterans with a total of over 30 years in the business.

Helicopters For People

Hughes final assembly line for the 269-A is 400 ft. long and flanked on either side by 10 sub-assembly bays. A total of 68,000 sq. ft. are being used for manufacturing and assembly. At normal capacity, to be reached next August, two completed crafts will roll off the line every working day.

By GEORGE E. HADDAWAY

DOES the small helicopter have the potential of someday replacing the single-engine conventional lightplane?

That's a question one hears with increasing frequency now that light 2-place helicopters for personal users are a reality. The Stanford Research Institute in a recent study says it can happen, and furthermore, in the next decade the civilian helicopter market will be worth over $2 billion, fixed-wing aircraft will lose sales to the helicopter for short-haul applications and personal and executive use of the private helicopter will be commonplace.

We have heard similar predictions before, but nothing happened. Now there's evidence in several quarters that perhaps some fresh winds are stirring and that a new aviation market is beginning to unfold — the true short-haul market without the need for airports.

One of the strongest winds today is coming from the Hughes Tool Company's aircraft division out in Culver City, California, where the groundwork is being laid not only to capture this long-promised short-haul market but also to help create it. And in the creating, Hughes openly states they intend to dominate the field, with expectations of becoming the nation's largest helicopter manufacturer.

Al Bayer, the company's vice president in charge of marketing, says that helicopters have been designed and produced until now for the military services and for highly specialized operators in the commercial field.

"We intend to put the helicopter in the hands of people," he told us with quiet but confident emphasis. "And we are not shooting in the dark or indulging in wishful thinking," he added. "We've uncovered real prospects in quantity — individuals with tangible evidence of need, desire and ability to buy. Over 50 per cent of those being attracted by our recent advertising have no need for, interest in, or experience with fixed-wing aircraft."

The Hughes experience in light helicopters began in 1955 when the Army called for a "flying jeep" design. Hughes' test flew theirs in 1957 and it was bought for evaluation by the U. S. Army. As one of the major factors in the Army's later development of the LOH (light observation helicopter) concept, this original work culminated in contracts last month to Hughes, Bell and Hiller for more than $17 million worth of three designs for evaluation in this significant move to improve modern reconnaissance and mobility. Turbine powered, the Army LOH might well be translated into a personal-use machine.

Hughes' success with the original 1957 2-place, which came out of punishing testing by the military with flying colors, led to the decision to produce a commercial model. April, 1959, saw the 269-A two-place utility helicopter certificated by the FAA.

Meanwhile, a market research team went to work and pin-pointed the potential market; a commercial sales department was formed and production facilities were engineered and readied. Now rolling, production of the 269-A

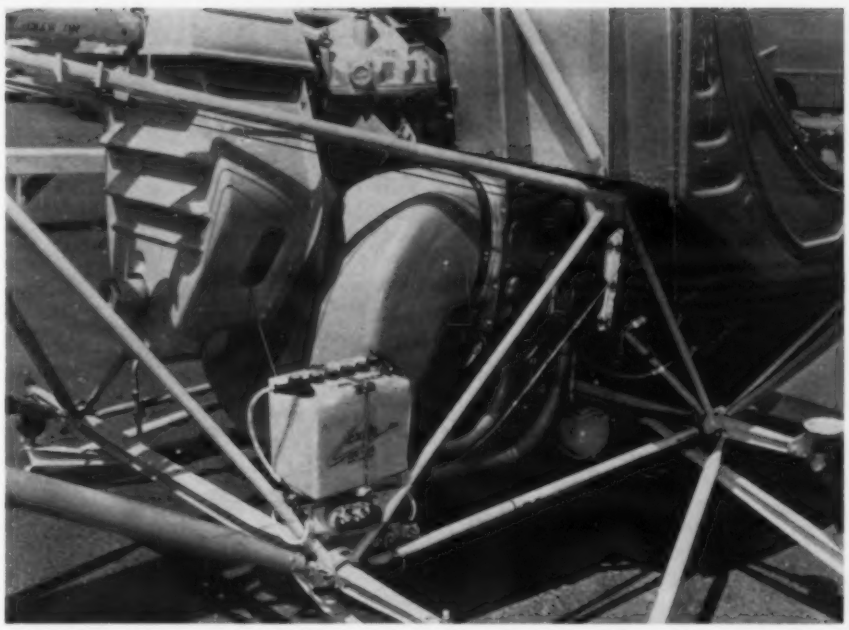
will reach one a day by March and two a day by next August. Production schedules, based on dealer orders and rate of retail sales, are constantly reviewed and revised by changing market projections.

A visit to the Hughes' establishment leaves no doubt as to how serious the company is in pushing for its avowed goal to dominate personal short-haul rotary wing transportation. Most impressive is the campaign to build, train and adequately stock an aggressive field sales and service organization. Regional company sales managers have already been trained and established in five of a total of six regional territories. Some 22 dealers out of an eventual 75 have been signed, with training, staffing and inventory in the mill.

Training of all sales personnel, from regional sales managers to dealers, salesmen and mechanics, is the vital element of the Hughes marketing program. All regional managers are rated helicopter flight instructors and all are in the 1,000-hour total-time bracket. All have been through the factory maintenance school. A completely integrated national program with the dual capability of teaching people to fly helicopters and properly maintaining machines after the sale is the major base for the forthcoming 1962 merchandising effort. "Let's be frank," say Hughes' experienced factory people, "the helicopter is a different breed of bird from fixed-wing aircraft. Different but not more difficult."

A new flight-training manual now being used at the factory's check-out school for dealers' rated helicopter instructors and a comprehensive maintenance course for dealers' qualified mechanics has just been completed as basic elements in preparing the retail outlets for training and maintenance proficiency prior to any sales being made. The unique flight-training manual, perhaps the simplest ever published, is a brain-child of the training and education manager, W. B. (Bill) Collins, former Navy helicopter instructor. His most recent experience has been in the field of commercial helicopter flight instruction and ground school courses for both fixed-wing-rated and non-flying businessmen.

Actually, the Hughes marketing program is a team proposition. The factory assigns a resident specialist, a regional manager, to each of six basic geographic regions. This man's first responsibility is to apportion franchise areas of balanced market potential within his region and select the most aggressive and capable outlet within each franchise area as authorized sales and service dealer for the 269-A. He then assists dealers with sales, service and training programs in close personal contact. In a way he serves many functions of a distributor and offers close affiliation and support with factory merchandising and promotion efforts directed to the dealer level for retail selling by dealers only and for building profits from accessory sales, flight training and maintenance.



The horizontally-mounted 180 hp. Lycoming is easily accessible and boasts time between overhaul of 750 hours. The automotive-type transmission is overhauled every 1,800 hrs. Economy cruise at design gross weight of 1,550 lbs. is 70 mph. Range with auxiliary tank is 350 mi. The 269-A's empty weight is only 867 lbs.

The major attributes sought in prospective dealers are enthusiasm and optimism about the market for economy helicopters. This was confirmed by our visit with the dealer on Santa Monica Airport prior to our day-long sojourn and flight demonstration at the factory. Jack Baumann of Santa Monica Aviation admirably attested to his and Bill Dehnke's faith in the extent and size of this untapped market. Had he not been acquainted with Baumann's success in fixed-wing sales and Dehnke's old-pro rotary-wing status (with 6,500 hours under his belt), we might have figured they were giving us a snow job. This, coupled with our previous helicopter hangar flying with Ralph Floyd of Wichita, whose United Airplane Sales, Inc., was one of the first Hughes dealers, dispelled any skepticism on what might be considered as over-optimism in the light helicopter business. What we saw and heard at the Hughes factory can be summed up in one sentence — they are in dead earnest about creating a new mode of air transportation.

The fact that the helicopter is "different" and the skills required to fly and fix a helicopter differ from those

Interior of Hughes 269-A is commodious and attractive, and features 360-degree visibility for the pilot and the passenger. The fully-articulated rotor system is only 25 ft. in diameter and clears the ground by nearly eight ft. Engine warm-up is made without turning rotor.

in the fixed-wing world is the least of their worries. When a 4-place machine is available, they estimate production of both sizes at 2,000 units annually. This, says Bayer, is conservative.

The four-place light helicopter for the civilian market in all probability will emerge from the turbine powered HO-6 Army craft to be built under the new light observation helicopter (LOH) contract announced the day

(Continued on page 49)

Growth Year For Helicopters

Helicopters, Operators and Heliports by States

FLIGHT MAGAZINE Compilation from Data by Helicopter Council, Aerospace Industries Association

State	Commercial Oprs.	Commercial Units	Executive Oprs.	Executive Units	Govt. Agencies Oprs.	Govt. Agencies Units	TOTALS Oprs.	TOTALS Units	Heliports and Helistops	Flight Schools
Alabama	1	1	....	....	1	8	2	9	2	....
Alaska	15	38	1	1	....	....	16	39	3	2
Arizona	6	9	....	....	1	1	7	10	3	....
Arkansas	1	1	....	....	1	1	2	2	....	....
California	75	258	20	36	2	4	97	298	89	12
Colorado	1	7	1	4	....	....	2	11	4	1
Connecticut	1	1	3	6	1	1	5	8	24	....
Delaware	1	1	....	....	....	....	1	1	2	....
Dist. Columbia	1	2	....	....	....	....	1	2	2	....
Florida	15	35	4	4	1	1	20	40	16	1
Georgia	1	2	....	....	1	2	2	4	6	....
Hawaii	1	1	....	....	....	....	1	1	5	....
Idaho	5	10	1	1	....	....	6	11	2	....
Illinois	8	29	6	5	1	2	15	36	108	4
Iowa	1	....	3	3	....	....	4	3	1	....
Indiana	2	2	2	1	1	2	5	5	16	....
Kansas	1	1	....	....	....	....	1	1	....	....
Kentucky	1	1	....	....	....	....	1	1	2	....
Louisiana	6	63	4	16	....	....	10	79	21	3
Maine	....	....	1	1	1	1	2	2	7	....
Maryland	2	2	1	1	1	1	4	4	6	....
Massachusetts	3	8	....	....	1	1	4	9	8	2
Michigan	4	6	....	....	....	....	4	6	11	1
Minnesota	2	4	....	....	....	....	2	4	3	....
Mississippi	....	....	....	....	1	2	1	2	1	....
Missouri	6	10	....	....	1	1	7	11	4	3
Montana	2	5	....	....	....	....	2	5	10	1
Nebraska	2	2	2	3	1	3	5	8	2	....
Nevada	3	5	....	....	....	....	3	5	8	1
New Hampshire	....	....	....	....	....	....	....	....	1	....
New Mexico	1	1	1	1	....	....	2	2	....	....
New Jersey	3	3	1	1	....	....	4	4	18	1
New York	5	13	8	9	2	7	15	29	10	1
N. Carolina	....	....	1	1	....	....	1	1	....	....
N. Dakota	2	2	....	....	....	....	2	2	2	....
Ohio	2	3	1	1	1	1	4	5	14	....
Oklahoma	4	16	1	2	....	....	5	18	2	2
Oregon	8	20	3	3	....	....	11	23	....	2
Pennsylvania	12	46	4	3	1	1	17	50	17	3
Rhode Island	1	3	....	....	....	....	1	3	4	1
S. Carolina	3	6	....	....	....	....	3	6	1	....
S. Dakota	1	1	....	....	....	....	1	1	....	....
Tennessee	2	2	3	3	1	3	6	8	7	....
Texas	6	10	16	37	....	....	22	47	17	2
Virginia	2	2	2	2	....	....	4	4	4	....
Utah	....	....	....	....	....	....	....	....	2	....
Washington	10	32	....	....	1	3	11	35	5	1
West Virginia	2	4	1	1	....	....	3	5	1	....
Wisconsin	2	2	2	2	....	....	4	4	7	....
Wyoming	1	3	....	....	....	....	1	3	1	....
U. S. TOTALS	234	673	93	148	22	46	349	867	479	44
CANADA										
Alberta	5	24	2	2	1	2	8	28	....	2
B. Columbia	5	86	6	15	....	....	11	101	2	2
Manitoba	1	1	....	....	....	....	1	1	....	....
N'foundland	1	2	....	....	....	....	1	2	2	....
Nova Scotia	....	....	....	....	1	7	1	7	1	1
Ontario	10	60	4	3	9	66	23	129	13	4
Quebec	10	33	1	4	1	1	12	38	3	2
Saskatchewan	1	1	....	....	....	....	1	1	....	....
Yukon	1	6	....	....	....	....	1	6	1	....
CANADA TOTALS	34	213	13	24	12	76	59	313	22	11
PUERTO RICO	....	....	....	....	1	2	1	2	4	....
U. S.-CANADA-PUERTO RICO TOTALS	268	886	106	172	35	124	409	1,182	505	55

NOTES: This compilation is based on data compiled on January 15, 1961, by the Helicopter Council, Aerospace Industries Association, and does not include approximately 100 helistops on oil rigs off the Louisiana and Texas coasts in the Gulf of Mexico.

ALTHOUGH 6 million dollars may not sound like a lot of money in these days of multi-billion figures, that amount has been allocated by the U. S. Army to each of three manufacturers for procurement of light observation helicopters and might well prove to be one of the most significant mileposts in U. S. rotary wing history.

Bell, Hiller and Hughes will share these funds for development of the LOH designs. In the entire program a total of 4,000 machines may eventually be produced for the Army, which by 1970 expects to have 10,000 pilots and 8,000 aircraft — mostly helicopters — of seven different types.

The major significance lies in the fact that with minor changes the LOH designs can become high performance, turbine powered four-place machines for the commercial market.

With this article is FLIGHT MAGAZINE's tabulation showing distribution by states of 1,182 helicopters and 409 operators. The table is based on Jan., 1961, data from the Helicopter Council of the Aerospace Industries Association, being the latest available. In comparing this compilation with the 1960 data, a 29% increase in total U. S.-Canada operators and a 26% increase in units is noted. In the U. S., there was 42% increase in the number of commercial operators, a 9% increase in executive operators and a 10% increase in government agency operators. There was 26% commercial unit increase in the U. S., a 20% executive unit increase, and a 12% government agency unit increase. In Canada, there was a 21% commercial operator increase, executive operators increased by 18%, and government agency operators increased by 33%. Canadian commercial units were up 28% over last year, executive units increased 72%, and government agency unit figures were up 46%. The state with the biggest unit increase was California (up 68), and for Canada it was Ontario (up 40 units). California also had the biggest operator increase (up 25) as was the case with Ontario (up 5). At latest count, there are 1.81 helicopters per heliport in the U. S. compared to 14.2 helicopters per heliport in Canada. In the U. S. there is an average of 2.5

(Continued on page 52)

Army contracts for LOH (light observation helicopter) prototypes were given each of three companies: Bell, Hughes and Hiller. Being four-six-place turbine-powered craft, they will be highly adaptive to commercial utility use. Bell's LOH, the Model 206 above left, has a single rotor, will carry pilot and fuel plus 400-lb. payload. The Hughes design, above right, is designated the Model 369, has four blades, each of which will interchange with blades on the firm's two-place commercial 269-A.

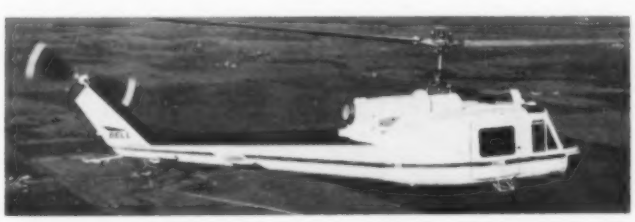
Current Production Commercial Helicopters

Factory Data, Dec. 1, 1961

Make and Model	No. Places	Hp.	Gr. Wt., Lbs.	Useful Ld., Lbs.	Fuel Gals.	Cr. Spd., Mph.	Price
Bell 47G-2A	3	240	2,850	1,212	41	83	$ 39,950
Bell 47G-3	3	240	2,850	1,241	41	83	45,950
Bell 47J-2	4	260	2,850	1,120	48	85	69,950
Bell 204B	10	1,100	6,500	2,182	155	126	285,000
Brantly B-2	2	180	1,600	620	30	85-100	19,950
Cessna CH-1C	4	270	3,100	1,020	60	90-120	79,960
Hiller 12E	3	305	2,750	1,050	48	87	NA
Hiller 12E4	4	305	2,750	975	48	87	NA
Hughes 269A	2	180	1,550	683	25	85	22,500
Republic Alouette II	5	480	3,300	1,426	153	106	105,480
Sikorsky S-62	11	1,050	7,500	2,711	182	98	273,485
Sikorsky S-58	12	1,525	13,000	5,370	198	98	269,250
Skorsky S-61L	28	2,500	19,000	8,125	410	141	695,000
Sikorsky S-64	Crane	4,050	38,000	20,760	880	110	NA
Boeing-Vertol 44A	19	1,425	14,350	5,360	300	101	298,500
Boeing-Vertol 107	28	2,500	18,450	8,025	350	155	647,000

NOTES: Bell 204B turbocopter is not yet in commercial production. Boeing-Vertol 107 price is $507,280 for the airliner version without engines (2 GE CT58-110), which cost app. $70,000 each to make Model 107 with engines cost app. $647,000. Republic Alouette II to be replaced by AiResearch turbine powered version, called the Lark, not yet in production.

New six-place turbine-powered Hiller utility helicopter, the "Ten 99," above, can lift more than a half-ton of cargo or six persons, twice that of current reciprocating engine copters of the same dimensions. Designed to serve either armed service or commercial needs, the "Ten 99" can hoist cargo or personnel through a trap door in the bottom.



Bell plans to commercially certify its Model 204B version of the Army Iroquois, above left. Twin-turbine Boeing Vertol 107 airliner, primarily a land machine, can land and take off from water on its sealed-in fuselage if necessary, above right. Production line of the popular two-place Brantly B-2, below left, has turned out 166 B-2's, 130 of them this year, and plans to produce 240 in 1962. Cessna Skyhook CH-1C, below right, has been held to limited production prior to formation of a thoroughly-trained international sales-service support team.

A Franklin engine powered the Vought-Sikorsky VS-300, world's first successful helicopter, shown above on its initial tethered flight in 1939. Igor Sikorsky himself is at the controls. Other experimental helicopters, such as the Bell, Hiller, Piasecki and McCulloch, also specified the Franklin powerplant for their machines.

Franklin Engine Production Is Revived

The Franklin Aircraft Engine Company of Syracuse, New York, a subsidiary of Aero Industries, Inc., has revived production of the well-known Franklin Aircooled line of helicopter and fixed-wing aircraft engines, and is developing several completely new engine designs, including a twin turbine powerplant for small helicopters.

Franklin supplied the first and only engine that powered the pioneering Sikorsky, Bell, Hiller and other helicopters. In 1939 when Igor Sikorsky flew his first ship, a Franklin engine supplied the power. When Bell Aircraft came into the picture, a Franklin engine was first, and years thereafter, thousands of Bell's were powered by Franklin engines, surveying pipe lines, helping fight forest fires, saving thousands of lives behind enemy lines in Korea, and performing thousands of various chores.

Hiller followed Sikorsky and Bell and again Franklin was the selected powerplant, and went with Hiller all over the world. Besides the giants in the industry, Franklin powered the McCulloch helicopter and the single-seat ship built by Piasecki helicopter during its formative stages. Among other firsts were also the Franklin-powered Northrop Flying Wing and Northwestern Aeronautical's cargo and troop transport.

As the military's requirements dropped due to the end of the Korean campaign, Franklin-powered helicopters began to be used more and more in civilian life. One mail carrying company claimed over 20,000 hours of fleet operation without an engine failure. But despite all this success in the military field, Aircooled Motors management lived with one goal and was among the first to anticipate the explosion in requirements for private and commercial airplanes and helicopters in the post war period. As far back as 1942, an advertisement proclaimed "Yes, the Helicopters Are Coming."

Unfortunately, the efforts of Aircooled Motors to maintain and extend their rightful place in private aviation was brutally interrupted in 1950 due to the bankruptcy of the Tucker Company, which owned Aircooled Motors. The company was then operated under the jurisdiction of the courts. From 1950 to 1961, although the company continued supplying helicopter engines, it was in no position to develop anything new.

Alexander Berger, president of Aero Industries, Inc., states that all efforts have already been made and will be made to continue to manufacture the previous line of Franklin and proceed as fast as humanly possible to develop the new family of engines, some of which had been started during the old management, and some of which are in the process of being certified by the new management. Besides improving the present line of helicopter engines, fixed-wing engines are being readied for certification. There is also a fixed-wing turbo-supercharged engine being certified which is said to be much lighter than any competitive engine in the field within the same horsepower range, lower in cost, easy on maintenance, and is similar to the 240-hp. turbo-supercharged vertical configuration engine being used presently in helicopters and being flown for thousands of hours. Negotiations are being conducted in the United States and abroad for installation of these engines in original equipment, in models presently being built, and in models on the draftingboard.

Several divisions of Aero Industries, Inc., are "first" in their line of business. One of the divisions, Energy Transformation Corporation, recently announced the development of an integrated turbine generator unit with a generator producing 40 KW that runs directly from the turbine at a speed of 39,000 rpm., and weighs only 90 pounds.

Feedback Systems Division of Aero Industries, Inc., is working on a contract for ground support equipment made to their own designs for guided missiles and a revolutionary design for artificial breathing on the ground for medical purposes and in space.

The company says it believes the days of the piston engine are numbered. Mr. Berger said, "The present period is only to permit the reciprocating engine to die graciously and the turbine must, and will follow."

Among the company's goals is a new small twin turbine powerplant for small helicopters which would provide simplicity and twin engine safety. A prototype is being built presently and should be ready for testing within six months.

In '62 increase the effectiveness of your key personnel with a WORLD STANDARD bell

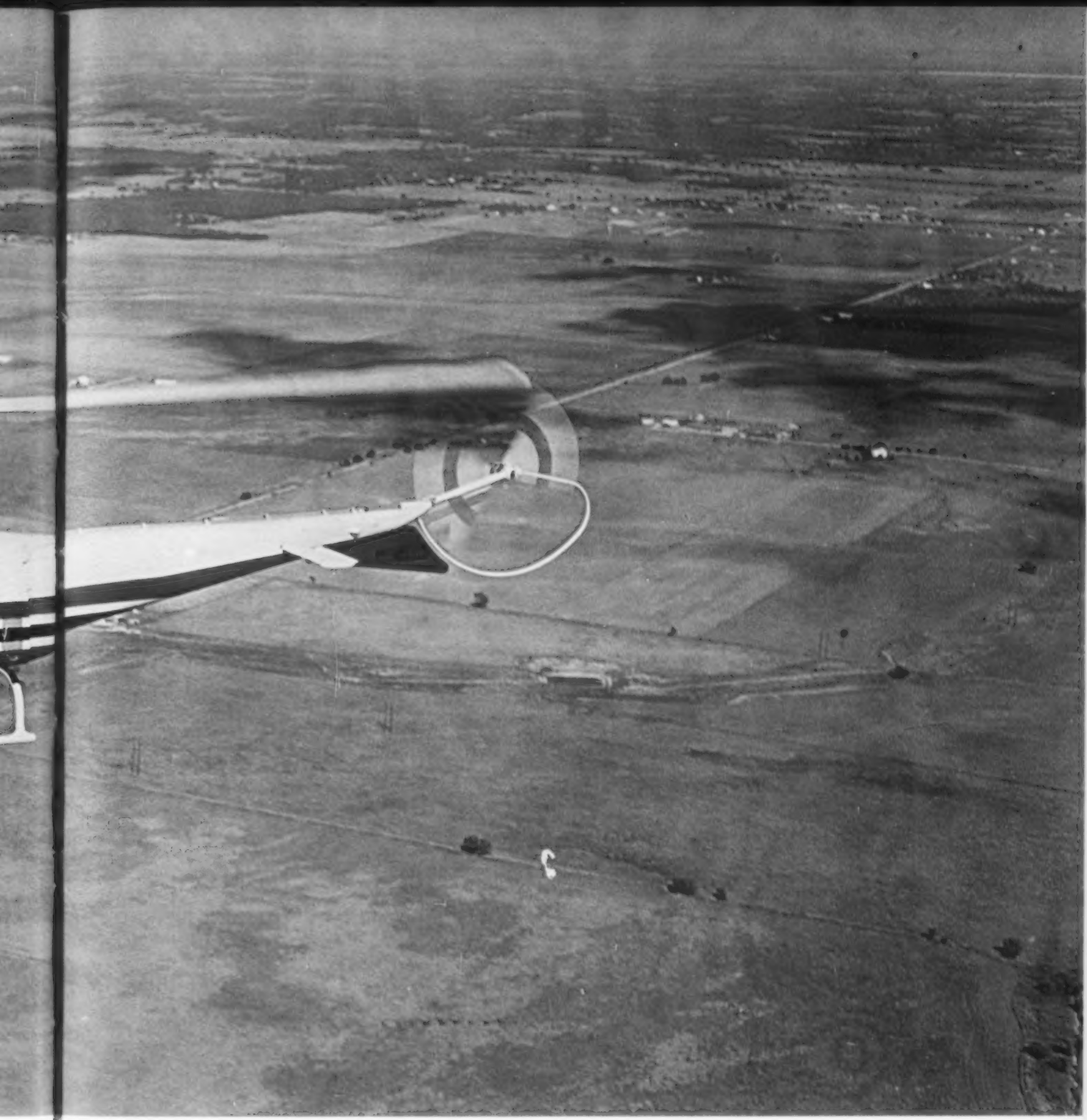
Improving the efficiency of your key personnel in '62 is as important a profit consideration as automation for a plant . . a computer for R&D . . data processing equipment for accounting. And a Bell helicopter does just this by flying your executives direct from plant to plant . . door to door . . over snarled traffic . . congested roads. Many of the most progressive firms have already discovered that this Bell is a go-everywhere . . do-everything vehicle that gives their executives more *productive hours* on the job. Make '62 the year your company, too, bought a Bell.

47J·2 the leader in 4-place executive helicopters

WORLD STANDARD

bell

MILITARY & COMMERCIAL HELICOPTERS



The Bell 47J-2 is a busy ship . . flying executives to important business conferences . . quickly bringing top engineers and scientists to trouble spots to untangle plant problems . . shifting construction experts from job to job. She's a sweet ship to fly, too, with 305 horsepower to command and the ability to deliver more payload from sea level to above 12,000 feet than any other 4-place helicopter. If your company's going places in '62, the Bell 47J-2 is the ship to take you there.

WORLD STANDARD

bell offers a wider range of helicopter models than any other company

You have a choice of *four* Bell models . . another result of Bell's leadership in helicopter design and manufacturing. Each utility model is designed for a specific payload category, so now your helicopter requirements can be matched with the right size ship to give you more payload pounds per operating dollar. Profits are never squeezed with high operating costs of an overpowered ship . . nor are gambles necessary, struggling dangerously with an underpowered ship.

Let us fit the *right* Bell to your operation. To do this we'll be glad to make a free *Bell Analysis* of your business needs to determine which Bell helicopter will pay its way, or if it will be smarter for you to charter a Bell to get special jobs done more economically. There's no obligation for this Bell service, of course . . just write: Commercial Sales Manager, Dept. 411L, P. O. Box 482, Fort Worth, Texas.

BELL 47G-2A

A low-priced workhorse

The 3-place 47G-2A carries the biggest payload in its class at the lowest cost per mile. Useful load is 1212 pounds . . speed up to 105 mph . . horsepower, 240 at takeoff, 220 continuous. The 47G-2A will pay out faster than any other helicopter, because it costs less to buy . . less to fly.

BELL 47G-3B

Turbo-supercharged for high altitude efficiency

Here's a real powerhouse. The 3-place 47G-3B carries a 1137-pound useful load up to 18,500 feet and with slightly lighter loads to a ceiling of 20,000 feet plus. This extremely functional, all-purpose ship performs all the tough jobs with ease.

BELL 47J-2

First choice for executive travel

With 305 horsepower, the 4-place 47J-2 delivers more payload, from sea level up to more than 12,000 feet, than any other helicopter in its class. Its custom designed interiors by Horton & Horton reflect the best in business travel. Yet this Bell becomes a multi-purpose ship ready for any assignment . . personnel, airborne electronics or cargo . . with its simple, quick-change cabin arrangements.

BELL 204B

The ultimate in helicopter utility

From a conference room in the sky to a cargo hauler, the 11-place 204B adds a new dimension in helicopter use for airlines, business, construction and industry. As the U. S. Army's prime utility helicopter, the HU-1 Iroquois, this turbine-powered Bell has set new world performance records and has been flown under all types of conditions throughout the world. Never have you been able to buy a more fully proven helicopter than Bell's 204B.

bell sets the world standard

. . over 67% of all commercial helicopters in the world are Bells.

BELL HELICOPTER COMPANY FORT WORTH, TEXAS

A DIVISION OF BELL AEROSPACE CORPORATION • A textron COMPANY

Success of the Republic Lark's new AiResearch Model 331 turbine engine is signaled by J. J. O'Brien, vice president and manager of the Garrett Corporation's AiResearch division. During initial testing, the Lark was climbed at 2,000 fpm. to 11,000 ft., found to be quiet enough with the door open to carry on a normal conversation in flight.

New Turbine For Helicopters

SUCCESSFUL testing of a new gas turbine engine, designed specifically for helicopters, has been announced by the manufacturer, AiResearch Manufacturing Division of The Garrett Corporation.

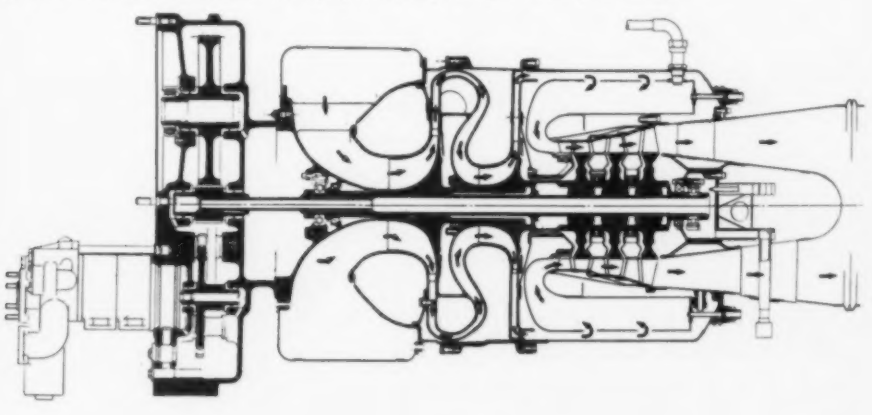
Called the Model 331, the new turbine has a power rating of 500 hp., can run for 30 min. at 450 hp., and has a dry weight of 200 lbs. The Republic Lark helicopter, which is the American counterpart of the French "Alouette," has been used on initial test flights of the engine. Said Test Pilot George Reno, commenting on the quietness of the engine after his first test flight: "It's the first helicopter I've ever flown where I could carry on a normal conversation while in flight with the doors off the copter."

Republic, planning to produce the AiResearch-powered Lark, formerly marketed the Alouette II with a Turbomeca turbine power plant. In comparing the two engines, Republic notes a 28 gph. fuel consumption rate in the Model 331, as compared to a 45-50 gph. rate in the Turbomeca. Weight is 70 lbs. less in the American engine, while helicopter range is increased by one-third. In testing, the Lark has climbed to 11,000 ft. at 2,000 fpm. and measurements indicate the over-all noise level at 100 ft. from compressor inlet to be 84 decibels (military requirements for the light observation helicopter are 90 decibels at 300 ft.). AiResearch reports that it was only seventeen days from the time the first Lark helicopter had been delivered to their Phoenix, Arizona, plant until the new engine had been installed. A 50-hr. unofficial pre-flight test run was made before installation.

AiResearch describes the turbine as an internal combustion turboshaft engine of the fixed-shaft type, with two-stage centrifugal compressor, a single annular combustion chamber, and a three-stage axial turbine. A single, integral gearbox houses both the reduction gear and the accessory gear trains.

AiResearch claims the title of "the world's largest producer of small gas turbines, having close to 10,000 such units in the field being used by military and commercial aviation organizations." The Model 331, however, is AiResearch's first prime mover engine.

The Model 331 is a good yardstick to measure the present state of the gas turbine art. Replacing the Turbomeca turbine engine as the Lark powerplant, it burns 28 gph. compared to the Turbomeca's 45-50 gph., weighs 70 lbs less, is quieter, and, at 500 hp., has a higher power rating. Cut-away view, below rt., shows engine's two-stage centrifugal compressor, single annular combustion chamber, three stage turbine. Note small size in left photo; dry weight is only 200 lbs.



Sagebrush-killing Hiller 12E has spray tanks refilled before making another hill and gully-dusting trip at 7,000-12,100 ft. in the Wyoming ranges. Elimination of sage increases productivity of grazing lands as much as three times by allowing natural perennial grasses to regrow. The helicopter's ability to hug steeply rolling terrain while loaded with over 900 lbs. of payload makes it especially suited for the work.

INTERVIEW WITH BELINN

(Continued from page 35)

that, as best we can determine, about 94 per cent of our passenger traffic is interline traffic exchanged with the many airlines servicing the Los Angeles International Airport. This type of traffic will continue to be substantial. But until all the helicopter airlines break away from the airport-to-airport concept the real mission of the helicopter is lost. For example, our flights to the downtown Los Angeles post office roof have been mail flights only. With the new twin turbo-copters we can now break away from the chains that bound us with the single-engine machines. Our job is to come up with an absolutely new form of service — a pure, true local air service pattern, not married to airports. All we've been doing since our inception is keeping our powder dry and awaiting the day that's here now with the breakthrough in flying equipment.

THEY SAID IT COULDN'T BE DONE

(Continued from page 37)

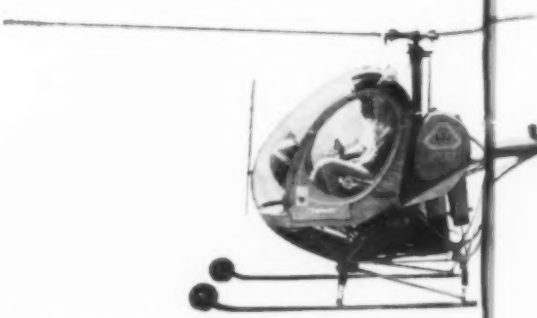
effect with American, Delta, National and TWA. One or more foreign carriers are expected to finalize similar plans by mid-December. Bagan hopes that still other airlines will join in soon. Agreement with each airline is on a separate and negotiated basis, naturally kept confidential. In general, SFO absorbs a minor portion of the through-plane reduction while the trunk airline absorbs the balance. To the passenger arriving at either Oakland or San Francisco airport and traveling to the other, there is no charge. To other destinations the regular fare is reduced about half for both first class and tourist passengers.

The reason for the trunkline interest in the through service and through fares, says Bagan, is principally because of the ever-decreasing ratio between air travel time and the surface travel time at either end of the flight. "Surface travel has become a bottleneck to air travel," states Bagan. "Oddly enough, it's an increasing irritation since the jets."

"Then, too," continues Bagan, "the airlines just cannot afford to offer jet service to two airports only 10 miles apart. Our helicopter service makes either city just nine minutes from either airport. This takes some of the civic pressure off the airlines in area airport problems."

SFO's gain from the joint fares stems from the thousands of trunk airline reservationists and ticket agents who are now selling SFO's service in hundreds of cities.

On the operational side, SFO pres-



Hughes 269A—Just $22,500

Here is the soundly-engineered helicopter which cuts previous costs in half—with lower purchase price, 13-cent per mile total direct operating costs, greatly simplified maintenance. ▪ Designed and built by aircraft pioneers, the Hughes 269A saves you time, tension, trouble. You *enjoy* going *where* you want to go, *when* you want to go. ▪ Now sold and serviced by a growing network of dealers offering expert instruction and complete after-sale service. ▪ **Costs less to buy...costs less to fly!** Get all of the facts *now*. Wire or write: Commercial Helicopter Sales, Dept. 0211, Hughes Tool Company, Aircraft Division, Culver City, Calif.

Save time where it really counts—*door to door*. The 269A easily moves in and out of small 30-foot spaces. You fly *over* traffic tangles, go places impossible to reach otherwise.

Fixed-wing pilots make the transition with a minimum of instruction. Even non-fliers learn faster. Your dealer now offers instruction and flight time at 1/2 former helicopter rates.

Full 360° visibility all-around...extra-wide doors, special tinted canopy, plenty of leg, shoulder and head room, handsome interiors...all add up to relaxed, comfortable flying.

HUGHES
269A
THE COMPACT HELICOPTER

ently has 55 employes on its payroll. These personnel man the five heliports, control reservations, fly the schedules and maintain the two copters. Maintenance is conducted in a leased portion of Pan American's hangar at International Airport.

Although it is a non-certificated airline, operating under FAA's CAR Part 42 (Air Taxi) authority, all procedures, controls, manuals, maintenance and flying are conducted in strict accordance with Part 46 the same as is required of the three CAB certificated helicopter airlines. This was requested by FAA and heartily concurred with by SFO.

Records are being maintained in accord with the CAB's Uniform System of Accounts. When these records are submitted to the CAB at the time that SFO presses for certificated status, they are sure to be eagerly analyzed by those who operate or hope to operate helicopter airlines.

CAB certification will be sought principally as a protective measure to insure against destructive competitive attempts. SFO's application now on file with the Board seeks authority in a 100-mile-radius area of San Francisco.

Flight operations are conducted under VFR regulations (minimums of 500-ft. ceilings and one-mile visibility), use a single pilot; are conducted almost entirely over water with only minor deviation from straight-line direct courses. Pilots are required to have 2,000 hours of helicopter time with 1,000 of the hours in transport category helicopters.

Maintenance problems are reported as being negligible with interruptions caused generally by such minor problems as replacing door hinges or latches. The General Electric engines have proven highly reliable despite usage that now reaches over 400 hours per month and averages over 1,000 engine-starts per month.

With receipt of the third S-62 in January, SFO plans to inaugurate service between the San Francisco airport and Palo Alto. The initial operating plan will then be complete. In the future are plans for extending service to such cities as Sacramento, San Jose, Stockton, Santa Rosa and Monterey. "But," says President Bagan, "this service over greater distances must await availability of a helicopter that will further reduce our present seat-miles costs."

Completion of its proposed basic system and in-the-black operations without subsidy are the first-year goals of SFO. To the man who ram-rodded the project into being against severe odds, it will be a satisfying accomplishment. This writer worked alongside Mike Bagan in his Central Airlines days. Success couldn't happen to a nicer guy.

Incoming airline passengers at San Francisco International Airport can't miss the two check-in counters of the San Francisco & Oakland Helicopter Airlines. The counters are near the exit gates of the airport's baggage areas and adjoin the escalator leading to the terminal's upper level.

HELICOPTERS FOR PEOPLE

(Continued from page 39)

before our visit to Hughes in November. The Hughes contract amounts to $6,352,879. After the Army's evalua-

Supervision and inspection of pipelines is the job of this Petroleum Helicopter, Inc., Bell 47G-2, which is operated with a team of similar craft out of Lafayette, La. Said to be better and less expensive than the airplane for pipeline patrol, the helicopter can quickly land at any spot along the line, speeding on inches above the "spread" or rising rapidly for an over-all look, all in about one-tenth the time required to do the same job by car.

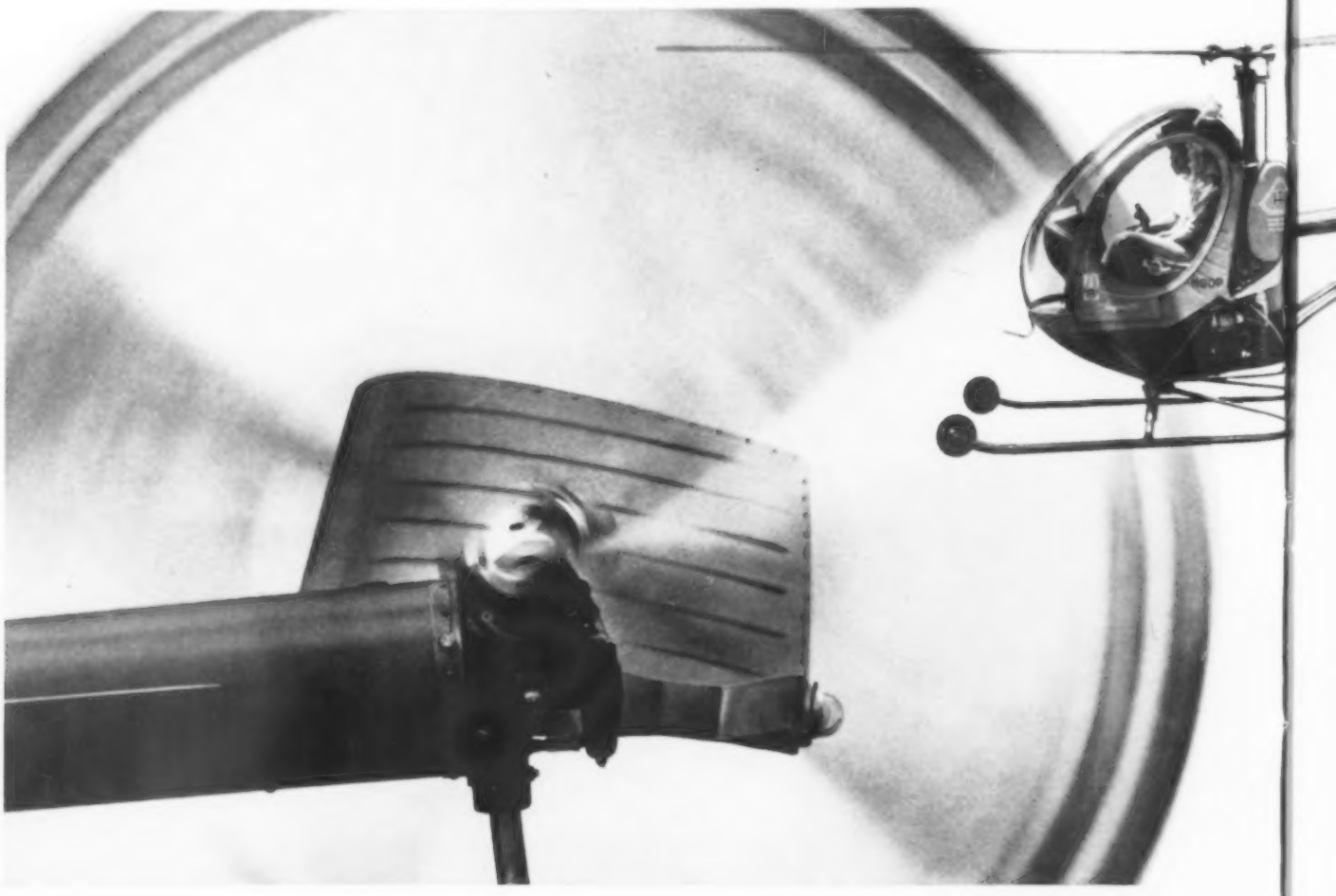
tion of the three contenders, who include Bell and Hiller, eventual procurement by the Army could total 4,000 machines. The civilian designation of the Hughes 4-place machine is Model 369. Plans are afoot for FAA certification with probable commercial marketing in 1964. At the present time the design is powered with the 250-hp. Allison T-63 turbine. Four rotor blades are employed, all interchangeable with the blades used on the 2-place 269-A.

"We'll build the market with our two-place, but think what will happen when we come out with a 140-mph. four-place job that can land and take off in a 40-foot square," Bayer exclaimed. We had to agree it would cut out a lot of hanging around airports for short hops and tap a market that probably never entertained the idea of fixed-wing airplane ownership.

Sales manager of the 269-A is Bill Fergusson, who came out of the fixed-wing sales field (Cessna) and started with Hughes in July, 1960. He soloed after nine hours of dual from Bill Collins and in April of this year accumulated the necessary 25 hours for his helicopter rating. Since then he has become an accomplished and completely oriented rotary-wing pilot and an enthusiast of the first order. At this writing, Fergusson is busy signing up dealers, mapping the 1962 sales program to develop tools for producing more prospects.

"We'll use all the known stimulants," he told us. "We have plenty of hot prospects to start with. Then we come along with an expanded advertising and direct-by-mail promotional effort, including sales film and a program to build more heliports. But our main effort will be aimed toward getting the utility across to people by use of the airport itself. Nothing can take the place of actually showing a prospect what the helicopter can do for him."

The company's unique flight-training manual is, in itself, a sales tool, according to Fergusson. It even points out what the common errors are in learning to fly a helicopter and makes the process "believable." Hughes discounts the popular concept given currency by some self-appointed experts that the helicopter isn't for the "common man." Hughes men agree it does take specialized training by competent instructors; hence the requirement for all their dealers to provide it. But they are out to prove they have a simple, rugged, dependable, safe transportation



vehicle with no superman talents needed and no mystery attached. Every dealership is a training center as well as a self-contained headquarters for sales, service and parts.

Is there a typical Hughes dealer? Not necessarily. While organizations with fixed-wing experience predominate, the company has no preconceived ideas on the matter. A firm in Little Rock, Arkansas, sells heavy machinery. A dealer in California sells John Deere implements and Caterpillar tractors. Fixed-wing people can usually take on a dealership with less initial investment. Hughes looks for a reasonably long business experience and financial stability after first determining the prospective dealer has the "fire" to really go out and sell. And you don't have to be on an airport to be a dealer. In fact, some fixed-wing organizations are moving their helicopter sales departments away from the airport.

One Hughes dealer in the Pacific Northwest recently sold two helicopters and ordered two more before receiving their first demonstrator. This, according to Fergusson, proves his theory that the helicopter seems to have a universal acceptance by the average person that fixed-wing aircraft never enjoyed. Dealer orders have ranged from a total of thirteen by one dealer to only two by some smaller organizations outside heavy concentrations of population, where most inquiries originate.

Financing helicopter sales doesn't seem to be a problem. The company has been swamped by inquiries and offers from banks and finance companies. But no financial tie-ins with the factory have been negotiated. Hughes has sponsored a unique full insurance plan under which the factory takes out the master policy. The plan should lead to a steady reduction in insurance costs as the experience curve climbs upwards.

The two-place 269-A is ideally suited for volume production and the commercial model of the turbine-powered four-place LOH, with many design features and components completely interchangeable, obviously shows the cost-cutters have been burning the midnight oil to achieve economies for the military as well as for the commercial buyer, not only in original and spare parts costs, but also in maintenance. The rotor blades on the Army's turbine job are the same one-piece bonded aluminum blades on the 269-A, except that four are used instead of three. The blades cost $450 each. Every aspect of design and manufacturing points very obviously to Hughes' seeking the ideal of military and commercial operations as complementary to each other for standardization as much as technically possible. We think this makes sense and will pay off handsomely in the years to come — not only for the factory, but for the customers and taxpayers as well.

The 17,000 sq. mi. Montana Minuteman missile project, with 150 launching sites, is served by helicopters belonging to Army Corps of Engineers, prime and subcontractors. The craft transport inspection personnel, officials, parts and equipment.

Next to the complete dedication to the proposition that they are starting

Hughes 269A cuts helicopter costs in half!

Facts that make the Hughes 269A your best buy: Low purchase price—only $22,500—is less than half the cost of previous helicopters. Total direct operating costs—only $9.71 per hour (or 13c per mile)—are little more than operating your car. Long-life components—rugged but simple—help guarantee years of trouble-free operation.

Designed and built by aircraft pioneers, the Hughes 269A saves you time, tension, trouble. You *enjoy* going *where* you want to go, *when* you want to go.

Now sold and serviced by a network of dealers offering expert instruction and complete after-sale service.

Get all of the facts now.
Wire or write: Commercial Helicopter Sales, Dept. 0212, Hughes Tool Company, Aircraft Division, Culver City, California.

Save time where it really counts—*door-to-door*. The 269A easily moves in and out of small 30-foot spaces. You fly *over* traffic tangles, go places impossible to reach otherwise.

Fixed-wing pilots make the transition with minimum instruction. Even people who have never flown learn faster. Your Hughes dealer now offers instruction and flight time at 1/2 former helicopter rates.

Full 360° visibility all around—extra-wide doors, special tinted canopy, plenty of leg, shoulder and head room, handsome interiors—all add up to relaxed, comfortable flying.

HUGHES
269A
THE COMPACT HELICOPTER

Washington's Olympic National Forest gets a 41-ft. tall forest lookout station on a 3,822 ft. ridge one month ahead of schedule and at one-half estimated cost thanks to Hiller 12E helicopter, above, which lifted 70,000 lbs. of building material to the site.

a transportation revolution, the integration or marriage of commercial with military models, plus or minus the highly specialized attributes of each, stands out as the great achievement of Hughes' entry into the light helicopter field, wherein they are not sparing the horses. If and when the transportation revolution comes, and the shuttling of business executives, key industrial people and ordinary folks in helicopters becomes commonplace, you can be sure the Hughes team will be in there making plenty of yardage and touchdowns. Hughes doesn't say there will be a helicopter in every garage. But their careful and thorough research produced an estimate of 234,000 firms and individuals who have the need and ability to buy some form of light, short-haul air transportation vehicle. That's quite a market, even if it has to be split between rotary-wing and the conventional lightplane.

GROWTH YEAR FOR HELICOPTERS

(Continued from page 40)

helicopters per operator, while in Canada there are 5.3 helicopters per operator.

Hiller

Hiller Aircraft has just announced a new six-place light utility helicopter, the "Ten 99," which it has been testing secretly for the past six months. A multi-purpose helicopter, the "Ten 99" was designed to satisfy both the requirements for a light fleet utility machine for the Navy and for a modern, all-purpose civilian helicopter. It is powered by a 500-hp. Pratt & Whitney PT6 turbine engine.

Hiller, with a $5.5 million commercial sales volume this year, showed a healthy $2 million increase over 1960. 25% of its unit sales, officials report, were accounted for by its four-place 12E4, which was introduced about a year ago. The company expects to have delivered 85 Series 12 machines by Dec. 31. Approximately 50% of Hiller's 1961 business was in Canada and the U. S., with the bulk of export sales going to the Latin American market. "Some alterations" are planned in the company's domestic distribution program.

Though prices of the 12E and E4 have not yet been released, a reduction is expected. Significant improvements in the 1962 12E and E4 include a 50% reduction in the number of finite life items (parts which must be discarded after a given service life), and a new torsional vibration damper which will improve maintenance characteristics and lengthen moving part life.

William Callery, Jr., has taken over management of Hiller's foreign and domestic sales. Phil Johnson is domestic sales manager and working with him is Fred Jamieson, Western regional sales manager, and Bob Vanaken. Ken Florance is Midwestern sales manager and A. D. "Dusty" Hight is in charge of Eastern sales. A Hiller Canadian regional sales manager has been appointed; he is Bob Landry. Fred Jamieson looks after sales in Western Canada.

Bell

Bell Helicopter Co., in selling $10 million worth of machines, realized a dollar volume increase of more than

Anyone can fly the Hughes 269A

Fixed-wing pilots can transition to helicopters with a minimum of instruction time in the new Hughes 269A. Even non-fliers learn faster. *Anyone can learn to fly it.* And, there's never a feeling of futility. Its immediate control reaction, plus power to spare, gives you complete mastery of this agile aircraft in the first few hours.

Good News: Your Hughes dealer offers instruction and flight time at ½ *former helicopter rates* in the 269A. Other costs make the same kind of sense: Purchase price—just $22,500; total direct operating costs—only $9.71 per hour (13c per mile); long-life components guarantee minimum maintenance. Now sold and serviced by a growing network of dealers offering expert instruction and complete after-sale service.

Costs less to buy . . . costs less to fly! Wire or write for all of the facts *today:* Commercial Helicopter Sales, Dept. 0209, Hughes Tool Company, Aircraft Division, Culver City, California

Save time where it really counts—*door to door.* The 269A easily moves in and out of small 30-foot spaces. You fly *over* traffic tangles, go places impossible to reach otherwise.

All mechanical components are rugged, simple and inexpensive—designed for long operating life. This means *years* of trouble-free service for you when you own a Hughes 269A.

Full 360° visibility all-around...extra-wide doors, special tinted canopy, plenty of leg, shoulder and head room, handsome interiors...all add up to relaxed, comfortable flying.

HUGHES
269A
THE COMPACT HELICOPTER

$1 million as well as a slight increase in unit sales. This increase of commercial sales was in the face of a fixed-wing decline in commercial sales during the year. It indicates more stability in the helicopter industry than in the fixed wing industry.

The firm received a $6 million LOH (light observation helicopter) contract along with Hiller and Hughes. Bell is also going ahead with plans leading to commercial certification of its turbine-powered Model 204B, commercial version of the Army Iroquois helicopter. "We have conducted an intensive world-wide market survey on the 204B for the past year and have found great sales potential for now and the future," Bell President E. J. Ducayet said. The 204B is powered by the commercial version of the Lycoming T-53-L9 gas turbine engine rated at 1,100 hp.

Bell continues to produce its popular 47G-2A, 47G-3B and 47J-2 helicopters.

Sikorsky

Major Sikorsky achievements for 1961 were the FAA certification of its S-61L 28-place helicopter and the beginning of fleet deliveries for the Navy HSS-2. Deliveries of single-turbine S-62's were made to seven operators, four of them foreign. Four each of the S-61L's are being delivered to Los Angeles Airways and Chicago Helicopter Airways, and a contract for two S-61N amphibious versions of the machine has been signed with Mitsubishi Heavy Industries Reorganized, Ltd., of Japan.

Follow-on orders for the HUS-1 (S-58) were also received by Sikorsky from the U. S. Marines, assuring continued production of that machine until at least 1963. The Pratt & Whitney twin-turbine S-64 Skycrane is scheduled for its first flight during the first quarter of 1962. The company has scheduled three S-64's for production.

In the field of development, Sikorsky foresees the military requirement for a 7-9 ton crane by early 1963, and plans to build a 20-ton-payload Skycrane for both military and commercial application. Sikorsky engineers are also studying a short-haul 60-passenger transport, which could be a pure helicopter or a direct-lift machine; a high-speed military transport of four-ton payload and a high-speed surveillance aircraft in the 16-20,000-lb. gross weight category; and subsystems, such as improved navigational, collision avoidance and anti-submarine systems.

Presently, 41 domestic and foreign commercial operators use Sikorsky helicopters.

Hughes

The Hughes Tool Co. is staging a campaign to outfit and expand sales and service organization for its present 269-A two-place utility helicopter and projected four-place Model 369. An eventual 75 dealers in six regional territories is planned. Presently there are 22 dealers and five regional sales managers. Production of the 269-A will reach one a day by March and two a day by next August. The four-place 369 will probably emerge from the HO-6 Army turbine-powered helicopter and reach the stage of commercial marketing in 1964. Presently the design is powered with the Allison T-63 250 hp. turbine, which drives four rotor blades. (See "Helicopters for People," page 38.)

Vertol

Vertol Division of Boeing has produced six of its twin-turbine 107's and expects FAA certification within weeks. The 107's, 27 of which have been ordered, have been used on airline route-proving and training flights since June under Class I provisional Type Certificate. New York Airways, which placed the first order for five of the 155-mph. 28-place "Airliner" versions, will receive its machines first, followed by Kawasaki Aircraft Company, which will produce the heli-

(Continued on page 71)

1912

WHEN CLYDE CESSNA wowed crowds with the 50-m.p.h. speed of his *Silver Wings*, he sat in an open cockpit and used no instruments. But with that plane, he began the constant design advancement which has made the Cessna Aircraft Company the world's leading producer of business aircraft—as well as the oldest.

NOW FOR 1962: To put all 50 years of aviation design experience into a line of airplanes that will remain advanced for many years to come—Cessna more than *doubled* the money usually spent for design advancement and retooling. And so successful were the results, Cessna *doubled* the warranty life on its entire Anniversary Fleet. For these reasons, when you buy a 1962 *Anniversary Model* Cessna, you'll get the world's best, most modern business aircraft!

CESSNA ANNIVERSARY FLEET

NEW CESSNA ANNIVERSARY MODELS SKYLARK SKYHAWK 172 and 150

Constant-Speed Propeller . . . Full Instruments . . . Wheel-Speed Fairings—New Skylark gives you more important features as standard equipment than any other plane in its class.

BESIDES MANY NEW ADVANCES—such as new 85-lb. increase in useful load plus a big increase in performance . . . brand-new interior and exterior stylings . . . new squared wing tips with faired navigation lights . . . new windshield sculpturing . . . new sharpened prop spinner and wheel-speed fairings—Cessna's Skylark offers the most complete equipment in its price class.

STANDARD EQUIPMENT includes constant-speed propeller . . . over-all paint . . . wheel-speed fairings . . . landing and taxi lights . . . navigation light flasher . . . push-button starter . . . gyros and vacuum system . . . turn-and-bank indicator . . . rate-of-climb indicator . . . sensitive altimeter . . . electric clock . . . and many many more features. Complete for $14,125.

NEW, EXCLUSIVE NAV-O-MATIC makes flying easier than turnpike driving. Simplified design with transistors and self-contained gyro (no additional gyros needed for its operation) is so economical, it's an optional "co-pilot" anyone can afford. Nav-O-Matic is available on all single-engine Cessna models for just $995 installed.

NEW CONSTANT-SPEED PROPELLER gives you better short-field operation and longer engine life. *Power-Geared* 175-h.p. engine with temperature-control cowl flaps boosts speed to 150 m.p.h. and range to 720 miles.

TAKE SIX IF YOU WISH—with a quick conversion to the new optional family seating. Your comfort is assured with finger-tip adjustable (fore and aft) seats and new optional 6-way adjusting front seats.

FOR MORE EXCITING NEWS, TURN PAGE

CESSNA

CESSNA ANNIVERSARY FLEET

The new Anniversary Model CESSNA SKYHAWK

YOU'LL HAVE TO FLY THE NEW SKYHAWK to appreciate its many new advances. Features new 45-lb. increase in useful load plus the same high performance. And new exterior and interior designs—with optional family seat for 6-place trips—make it look as great as it performs. Comes complete with a long list of bonus features—such as a push-button starter and engine-driven vacuum system . . . over-all paint . . . wheel-speed fairings . . . and a full complement of flight-ease instruments—for just $11,590. (While you're at your Cessna dealer's, try the new Anniversary Model Cessna 172. Featuring new design advances combined with the same type engine that powered a Cessna 172 to the world's flight-endurance record, it gives you speeds up to 139 m.p.h. and range up to 780 miles. $9,895.) NOW READY AT YOUR CESSNA DEALER'S: 1962 AIRPLANE BUYER'S GUIDE—*gives complete comparison of the new Cessna 172 and competing aircraft.*

Thirteen business aircraft 150 172 Skyhawk Skyknight 180 Skywagon

CESSNA ANNIVERSARY FLEET

The new Anniversary Model CESSNA 150

NOW 1962's LOWEST PRICED 2- TO 4-PLACE BUSINESS PLANE, the Cessna 150 boasts such advantages as the new optional family seat for conversion to 4-place family trips . . . new cruise and climb performance . . . and new exterior-interior stylings—as well as Cessna's famous High-Gliding Wing . . . huge Para-Lift flaps . . . and Land-O-Matic landing gear. $750 DOWN can put you in the pilot's seat—*including free flying lessons.*

FOR A DEMONSTRATION FLIGHT in any of Cessna's Low-Priced Four airplanes, and complete details of the easiest way yet to buy a new Cessna, call your nearby Cessna dealer now. (See Yellow Pages.) Also ask him about his auto-type lease plans. Or for further information, write: Cessna Aircraft Company, Wichita, Kansas. *All prices with std. equip., f.a.f. Wichita.*

82 Skylane 210 Skymaster 310 Skyknight Skyhook CESSNA

Musketeer instrument panel, with T-grouping, has a quickly-removable standard flight group. Beech plans to furnish its own VHF navigation-communication radio package on the production airplane.

New Beech Fixed-Gear Design Marks Firm's Re-Entry Into Low-Price Field

First Deli

FIRST details have been released on Beech Aircraft Corporation's new $12,000 four-place fixed-gear Model 23 "Musketeer," for which Beech forecasts a market consisting of about 4,500 units worth $50 million by the end of 1966.

Featuring several lightplane innovations, including the pioneering use of metal bonding and metal honeycomb materials, it will also introduce a new concept in business plane marketing with the standard airplane coming off the production line complete with essential instrumentation and a new Beechcraft navigation and communications system already installed.

The prototype began flight testing three weeks ahead of schedule on October 23, will begin FAA certification soon and Beech expects to start production deliveries in the early Fall of 1962. The prototype is powered by a 160-hp., 4-cylinder Lycoming O-320-B2C engine driving a fixed-pitch Sensenich propeller.

Design performance includes a top speed of 146 mph., 138-mph. cruise speed on 75% of power, 128-mph. cruise speed on 65% of power, 60-mph. stall speed with power off and flaps extended and 700-fpm. rate of climb. It has a useful load of more than 1,000 lbs. at a gross weight of 2,300 lbs.

Two standard wing tanks of 30 gals. each provide a 60-gal. fuel capacity. This is called the "standard maximum fuel capacity." "Standard" fuel capacity is called 40 gals., the tanks being filled to two-thirds capacity in order to carry higher payloads. Using the 60-gal. capacity, range will be 920 miles at 138 mph. or 980 miles at 128 mph. With 40 gals., range will be 610 miles at 138 mph. or 640 miles at 128 mph.

The fixed tricycle landing gear has a 141-inch tread — almost 12 ft. wide. Articulated-type cast struts house rubber-in-compression shock absorbers. The main gears and nose gear are identical for maximum parts interchangeability and the main wheels are equipped with hydraulic brakes.

An all-movable horizontal tail, with trim tab, provides greater control with less area and weight than conventional designs.

One-piece wrap-around windshield, double contour cabin top accent clean look of Model 23 prototype. Design concept behind the Musketeer emphasizes simplicity, strength, piloting ease and low costs.

Prototype Musketeer uses Lycoming engine of 160 hp., cruises 138 mph. on 75% power, and can fly as far as 980 miles on its 60-gallon fuel capacity. Preliminary design studies were begun several years ago, with the Musketeer's first flight taking place October 23 — three weeks ahead of schedule. Beech expects to begin production deliveries in the early Fall of 1962.

...ils On $12,000 Musketeer

Glass-smooth laminar-flow wing results from ...ing skin being bonded, not riveted, to "honeycomb" ribs forward of the spar.

The complete powerplant installation bolts to the airplane as a separate subassembly, providing quick and easy maintenance access to instrumentation, controls and accessories.

Of major design interest, the laminar-flow wing has intermediate ribs of metal-bonded, honeycomb "Truss-grid" construction. The wing box is built with a single spar and ribs. Wing skin is bonded to the ribs, providing a glass-smooth surface for laminar-flow efficiency and minimum drag. "Truss-grid" is a patented metal honeycomb sandwich material, in which alternate layers of corrugation are aligned 90 degrees to each other for rigidity in all directions. Ribs are routed out of this material, its finished thickness being 1 inch. These are the intermediate ribs, which are used forward of the spar. The wing skin is bonded to them with Scotchweld adhesive instead of rivets. Ribs at each end of the fuel tank bay are permanent-mold aluminum castings. Standard sheet metal ribs and riveting are used between the spar and the trailing edge.

Chief reason for the use of honeycomb and metal bonding is to achieve low-cost high-volume production, plus the need for mirror-smooth skin on the laminar-flow airfoil.

Each spar extends to the center of the fuselage, where they are joined by bridge-type connection plates at top and bottom to complete the carry-through structure. Wing shear bolts are also secured to fittings on each side of the fuselage. This construction eliminates the conventional but costly center section and is more adaptable to volume production. To prove its strength, Beech says it conducted a series of exhaustive tests in which load cycling ranged from 0 to 3.5 G's, the wing being subjected to normal maximum operating loads equivalent to 100,000 hrs. of flying time.

Beech Model 23 Musketeer

Design Data

Prototype powered by 160-hp. Lycoming O-320-B2C

Price	App. $12,000
No. Seats	4
Gross Wt., lbs.	2,300
Empty Wt., lbs.	1,235
Useful Load, lbs.	1,065
Useful Pct. of Gr. Wt., %	46.56
Std. Fuel Cap., usable gals.	45
Opt. Fuel Cap., usable gals.	60
Oil Capacity, qts.	8
Stall Speed, flaps down, mph.	60
High Spd., sea level, 2,700 rpm., mph.	146
Cruise Spd., 75% hp. @ 7,000 ft., mph.	138
Cruise Spd., 65% hp. @ 10,000 ft., mph.	128
Range @ 65% hp., 10,000 ft., 60 gals., mi.	980
Range @ 75% hp., 7,000 ft., 60 gals., mi.	920
Take-off Dist. over 50-ft. Obst., ft.	1,420
Rate of Climb, fpm.	700
Service Ceiling, ft.	15,500
Wing Area, sq. ft.	145
Wing Loading, lbs. sq. ft.	15.85
Power Loading, lbs. hp.	14.36
Span, ft.	33
Length, ft.-ins.	24-2
Height, ft.-ins.	7-4
Cabin Length, ft.-ins.	10-3
Cabin Width, ft.-ins.	3-5
Baggage Cap., lbs.	120

NOTES: Performance is for gross weight at sea level unless noted.

The 44-in.-wide cabin section consists of a basic keel formed by the floor and lower skin with longitudinal members, side panels of rolled skin and stringers, a minimum number of bulkheads and a double-contour cabin top. A one-piece wrap-around windshield is used. Beech said it static-tested the lower cabin section to 6.6 G's, exceeding FAA normal category requirements by 18%.

The Musketeer will be licensed in the Normal Category at 2,300-lb. gross and in the Utility Category at 1,950-lb. gross, the latter category for instructional purposes in which it will be approved for spins. It has been built and tested to an ultimate design load factor 6.6 times its maximum gross weight.

Wyman L. Henry, Beech vice president for marketing, said the Model 23 will be offered under a new "total marketing concept" as a ready-to-fly airplane with many standard appointments normally listed as optional equipment. These standard items will include necessary instrumentation and a Beechcraft VHF navigation-communications radio package. The instrument panel, with T-grouping, has a quickly-removable standard flight group including airspeed, altimeter, compass, clock, rate of climb, turn and bank, outside air temp and a stall warning indicator. Standard engine instruments include tachometer, engine cluster (fuel and oil gauges and ammeter) and engine primer.

Standard equipment includes individual toe brakes, hand parking brake, adjustable trim tab control, landing, navigation, cabin and instrument lights and other items. Standard equipment also includes fixed-pitch 74-in. forged aluminum-blade propeller equipped with spinner, 12-volt electrical system, battery, 35-amp generator, voltage regulator, key-switch starter, auxiliary fuel pump, carburetor, induction air filter, exhaust manifolds, muffler and cabin heater.

The standard interior features vinyl and fabric upholstery panels with foam core backing for soundproofing. Ventilating, heating and defrosting systems are also standard. Front seats are track-mounted, the floor being flat from the fire wall back to the rear seat. The left front seat locks in any of five track positions and the right front seat may be moved all the way rearward to allow easy access to the pilot's seat. Back angles may be adjusted for comfort and folded down for ease of entry.

Interior cabin dimensions include length of 10 ft. 3 inches and width of 3 ft. 5 ins.

Beech has long needed a four-place contender for the market in the $10,000-$12,000 category. Wyman Henry explained that more than 11,200 such lightplanes were sold by the general aviation industry during the 1956-1960 five-year period. Industry projections, he said, predict that some 13,500 of them will be sold in the next five years — 1962 through 1966. Beech, he pointed out, has aimed the Musketeer at capturing a third or more of this market. If successful on such a scale, Beech would sell about 4,500 Musketeers worth some $50 million. This would call for production of about 900 Musketeers annually, with a retail value of about $11 million.

The Musketeer thus would broaden the base of Beech owners by attracting new prospects to the Beechcraft line — prospects who have had to look elsewhere for a new 4-place costing $12,000 or less. The new Musketeer also is suitable for flight training and the idea here is simply that people who learn to fly a Beech will continue with the Beech line, upgrading themselves to the Debonair, the Bonanza and on into multi-engine Beechcrafts. There is another angle involved — the low-priced Musketeer will be useful in the drive for more dealers.

(Continued on page 78)

Jet-age aft section of new Musketeer, above, shows generous size of swept rudder, all-moving stabilator. Fixed tricycle landing gear, below, uses rubber in compression to cushion landing shock.

Scarcity of wing rivets in the Model 23, below, is possible with the new Beech bonding principle and results in a smoother laminar flow. Wing tips are designed to stall last.

In-flight photo of Musketeer shows large degree of dihedral in constant-chord wings. The new Beech bears only a slight family resemblance, was designed for simplicity rather than high performance.

Dare DNCI-1 VOR/ILS omni indicator and DR-480 receiver, above right, are general aviation's first practical "solid state" omni equipment, will operate off dry cells, above left, if aircraft electrical system fails. Below, panel of Dare-equipped Beech Bonanza mounts DADF-1A ADF, DM-3 three-light marker beacon receiver, dual DNCI-1 VOR/ILS indicators, two DR-480 omni receivers, DTR-360B transceiver, DTX-10 auxiliary transmitter, and nav/com toggle switch board.

—(FLIGHT MAGAZINE Photos.)

Omni Breakthrough

World's First Completely Transistorized Omni System Can Operate on Its Own Stand-By Emergency Batteries In Case Of Electrical Failure

THE first practical "solid-state" VHF navigation receivers and indicators for general aviation aircraft have been perfected by Dare, Inc., and are now available from Dare dealers. They are the 480-channel Dare DR-480 omni receiver and the Dare DNCI-1 VOR-ILS indicator.

Both the receiver (110 milliamps) and the indicator (60 milliamps) draw less amperage combined than a single instrument lamp (175-200 milliamps) because they're completely transistorized, with no vacuum tubes. They can operate from small dry cell batteries as well as from an aircraft electrical system, enabling the pilot to use dry cell batteries for an additional or auxiliary electrical system for continued navigation in case his aircraft electrical system fails. The new Dare equipment thus pioneers new safety and reliability standards, especially for IFR flying.

Elliott Polansky, Dare sales manager, operated the new equipment for us in his new Bonanza demonstrator, which has a toggle switch connecting a dual navigation installation to both the aircraft's electrical system and a small cluster of 3 dry cell batteries.

Polansky also demonstrated a portable dual navigation system — a little carrying case containing dual 480-channel receivers and VOR-ILS indicators plus three 9-volt dry cell batteries. This "magic box" has no outside connections — the power is all self-contained in the little dry cells. Polansky said he had been operating it at recent aircraft sales meetings, piling up about 80 hrs. of intermittent demonstrations without draining the batteries.

In his Bonanza, we climbed out of the airport and selected an omni radial, steadying the needles. To show how the navigation system operates on alternate battery power, Polansky cut the electrical system's switch. As the omni needles went dead, he flipped the master "nav" switch from "normal" to "emergency," thus feeding dry-cell

(Continued on page 76)

Improved Piper Comanche

Biggest Single-Engine Piper

Boasts Better Flaps,

"Ruggedized" Engine,

"Palm Beach" Interior

THE 1962 Piper Comanche 250 features a number of changes and improvements that should expand the high-performance airplane's usefulness and popularity. Since its introduction in 1958, the Comanche design has been the largest-selling retractable-gear private airplane in the world.

Piper Comanche 250

Factory Data

Price	$21,990
Lycoming Engine Model	O-540-A1A5
Hp.-rpm.	250 @ 2,575
Gr. Wt., lbs.	2,900
Empty Wt., lbs.	1,630
Useful Load, lbs.	1,270
Useful Pct. of Gr. Wt., %	43.8
Std. Fuel Cap., gals.	60
Optional Fuel Cap., gals.	90
Stall Spd., with flaps, mph.	61
Top Spd., mph.	190
Optimum Cruise Spd., opt. alt., 75% hp., mph.	181
Fuel cons., 75% hp., gph.	14
Cr. Range, std. fuel, 75% hp., mi.-hr.	740-4.3
Cr. Range, opt. fuel, 75% hp., mi.-hr.	1,100-6.4
Optimum Range, opt. fuel, mi.-hr.	1,650-11.2
Take-off Run, ft.	760
Landing Roll, Flaps Dn., ft.	650
Best Rate of Climb Spd., mph.	95
Rate of Climb, fpm.	1,350
Service Ceiling, ft.	20,000
Absolute Ceiling, ft.	22,000
Wing Span, ft.	36
Length, ft.	24.9
Height, ft.	7.3
Baggage Capacity, lbs.	200

NOTE: Performance is for gross weight at sea level unless noted.

New "Max-Lift" slotted flaps eliminate landing float, reduce landing speed and improve the Comanche's short field ability. Flaps are electrically operated, extend down and out to a maximum angle of 32 degrees.

250 For 1962

Though prices are up from $1,504 to $2,304 on all four Comanche 250 models, the plush new "Palm Beach" interior, "ruggedized" Lycoming power plant and more effective slotted flaps seem to justify the added costs and will add to the slick Piper's appeal.

Optional equipment for the new Comanche includes distance measuring equipment (DME), Piper AutoControl, and Piper AltiMatic, triple-axis autopilot. Prices for the four models, with price increases noted, are:

Standard	$21,990	up $1,505
Custom	$23,780	up $1,504
Super Custom	$26,080	up $2,304
AutoFlite	$26,880	up $2,304

The Comanche's new "Max-Lift" flaps extend 32 degrees downward and outward into the slipstream. More effective than the old flaps, they knock out landing float, says Piper, and reduce the stall speed 4 mph. to 61 mph. They achieve a 20 per cent reduction in the take-off distance to clear a 50-ft. barrier and a 15 per cent reduction in landing distance over a 50-ft. obstacle. Flap and gear controls are now functionally-designed.

The Comanche's 250-hp. Lycoming engine is the 0-540-A1A5, which is beefed up to last longer and cost less to maintain. The new "ruggedized" mill has extensive nitriding for extra hardening and longer wear, has new "choked" cylinders, and pistons with four rings for higher compression and lower oil consumption. For the first time, Bendix fuel injection will be offered optionally for this engine. The injection equipment offers precise mixture adjustment, exact fuel consumption indication and freedom from carburetor icing. This year's "shower of sparks" magnetos make starting easier.

There's a new paint design for 1962 which combines Daytona white with choice of El Paso brown, Newport blue, Pontiac red, Tampa green, Bahama blue and Phoenix tan. Three-tone exterior paint is optional.

Biggest interior news for the Comanche line is its new "Palm Beach" offering, optional in any model for an extra $320. This layout uses genuine leather to cover foam-rubber con-

(Continued on page 76)

Comanche 250 instrument panel shown below has full IFR instrumentation. Included in layout is Piper AltiMatic Autopilot with course selector and heading lock, altitude selector and hold; three VHF receivers, two transmitters (including 360-channel, 50 kc capability), two VOR/ILS localizer indicators, automatic direction finder (ADF), and distance measuring equipment (DME). Note remaining instrument blanks for additional equipment, glove compartment on right.

Four New Cessna

Skylark---New constant speed prop

OF 13 aircraft in Cessna Aircraft Company's "anniversary fleet" for 1962, four were presented in public showings last month and others will follow in dealer showings during the coming months. The four already unveiled are the 2-place Model 150, the 4-place Model 172 and its equipped version, the Skyhawk, and the equipped 4-place Skylark.

The Model 150 is priced the same as for last year at $7,495, but price increases are posted for the other three models, with the 172 up $100 at $9,895, the Skyhawk up $115 at $11,590 and the Skylark up $350 at $14,125.

At Cessna's annual factory sales meeting, company officials were optimistic for 1962. Del Roskam, senior vice president, foresees "the best marketing year in the industry's history and a record year for Cessna," pointing to a continuing upswing in business aircraft usage, a growing pleasure-flying market, significant increases in export sales and a promising rotary-wing market for the 4-place Skyhook.

Roskam said Cessna is investing more than twice any previous year's expenditures for development. Evolving from this effort are two new models, the tandem-engine Skymaster twin and the Skyknight version of the 310 twin with turbosupercharged engines; redesign of three current models, the 182, Skylane and 210, and improvements to all models. Roskam believes growth of the multi-engine market will be a major factor. Cessna's stimulant for this growth is the new tandem-engine, 4-place Skymaster, designed for low price and ease of piloting. Because its fore-and-aft engines are on the center-line, loss of either will not cause the engine-out yaw common to twins having wing-mounted engines, and Cessna's use of the push-pull engine arrangement is aimed at eliminating the requirement for a multi-engine rating. The high-wing Skymaster, which has a twin-boom tail, will be FAA certificated during the Winter and is scheduled for introduction on the market during the Summer of 1962. It has fixed tricycle gear.

Model 172 and Skyhaw-I

1962 Cessna Models 150, 172, Skyhawk and Skylark

Factory Data

	Model 150	Model 172	Skyhawk	Skylark
Price	$7,495	$9,895	$11,590	$14,125
No. Seats	2	4	4	4
Engine (Cont'l)	O-200-A	O-300-C	O-300-D	GO-300-E
Horsepower @ rpm.	100 @ 2700	145 @ 2700	145 @ 2700	175 @ 3200
Gross Wt., lbs.	1,500	2,250	2,250	2,450
Empty Wt., lbs.	945	1,260	1,330	1,410
Useful Load, lbs.	555	990	920	1,040
Useful Pct. of Gr. Wt., %	37	44	40.8	42.2
Fuel Cap., gals.	26	42	42	52
Oil Cap., gals.	1.5	2	2	2.5
Stall Speed, mph.	50	52	52	55
Top Spd., mph.	127	139	140	150
Cruise Spd., 75% hp., mph.	125	131	132	142
Cruise Range, 75% hp., mi.-hrs.	500-4	535-4.1	540-4.1	550-3.9
Optimum Range, mi.-hrs.	945-9.1	780-7.8	780-7.8	720-6.9
Rate of Climb, fpm.	760	700	700	950
Service Ceiling, ft.	15,600	14,550	14,550	17,800
Take-off Run, ft.	680	825	825	600
Take-off Dist. to 50 ft., ft.	1,205	1,430	1,430	1,205
Landing Roll, ft.	360	690	690	610
Landing Dist. from 50 ft., ft.	1,055	1,140	1,140	1,200
Wing Area, sq. ft.	160	175	175	175
Wing Loading, lbs. sq. ft.	9.4	12.9	12.9	14.1
Power Loading, lbs. hp.	15	15.5	15.5	14
Span, ft.-ins.	33-6	36-2	36-2	36-2
Length, ft.-ins.	21-6	26-6	26-6	26-6
Height, ft.-ins.	6-11	8-11	8-11	8-11
Baggage Cap., lbs.	80	120	120	120

NOTE: Performance is for gross weight at sea level unless noted.

New Nav-O-Matic Autopilot

Available on its 1962 models for the first time will be a new electronic flight controller, the "Nav-O-Matic" single-axis autopilot, which features a transistorized heading-hold circuit. When it is engaged and trimmed, the Nav-O-Matic automatically keeps the wings level to hold a desired heading automatically and with its controller the pilot can dial standard rate turns. System components include a controller, a motor-driven servo with electromagnetic clutch which operates the ailerons, and an inclined rate gyro

a Models

mounted behind the instrument panel. Installed price is $995 and installed weight is 9.5 lbs.

Model 150

Increased performance, optional "buddy" seat for two children, relocation of the main landing gear for easier ground handling and redesigned wingtips are featured in the 2-place, 100-hp. Model 150. Prices are unchanged for the three versions of the 150, being $7,495 for the standard, $8,400 for the trainer and $8,995 for the commuter.

The new Model 150 has 5 lbs. more

Typical seating arrangement for 172, Skyhawk and Skylark, above, offers optional six-way adjustable front seats, headrests, new rear "family seat" with 120-lb. capacity. New instant-reading magnetic fuel gauges are standard on the Skylark instrument panel, below. Nav-O-Matic autopilot and the pictorial horizon and directional gyro are optional.

eyhaw—Increased useful load

useful load due to a reduction of that amount in empty weight, its top speed is 3 mph. higher at 127 mph. and its cruising speed is 4 mph. faster, Cessna listing it at 125 mph. on 75% power as compared to last year's listing at 121 mph. on 70% power. Service ceiling is 300 ft. higher at 15,600 ft.

Its main gear has been relocated 2 inches rearward of the center line for better ground handling and more flexible loading capabilities. A new propeller is used and a fiberglass prop spinner of needle-nose design is optional. Redesigned wingtips incorporate faired navigation lights, smoother surface, squared trailing edge and eliminate external laps except for the navigation light lens.

In addition to two standard adjustable seat backs, the new model has an optional "family" or buddy seat which can be fitted into the baggage compartment for two children and a capacity of 80 lbs. Optional fully-adjustable pilot and co-pilot seats are also available. Twelve standard two-color stripings and twelve optional two-color over-all paint jobs are available. Interiors are in fabrics of turquoise and light brown, beige Elastoplex headliner, beige foam-step carpeting and black Royalite instrument panel.

Optional equipment for the 150 includes the $995 Nav-O-Matic autopilot, a new pictorial horizon and directional gyro featuring "natural" sensing or interpretation ($265 exchange in the Commuter), Patroller wings with 35-gal. fuel capacity ($175 exchange), and Patroller plexiglass door panels ($165 exchange). On the standard Model 150, outside air temperature gauge, rate of climb, sensitive altimeter, turn and bank indicator and electric clock are optional.

Model 150---Faster cruise and climb

They are standard on the Trainer and Commuter, on which the Narco Superhomer is also standard, with the Narco Omnigator, King KY-90 and Sunair T-5-DA available on an exchange basis for the Superhomer.

More than 1,400 Model 150's have been produced since 1959.

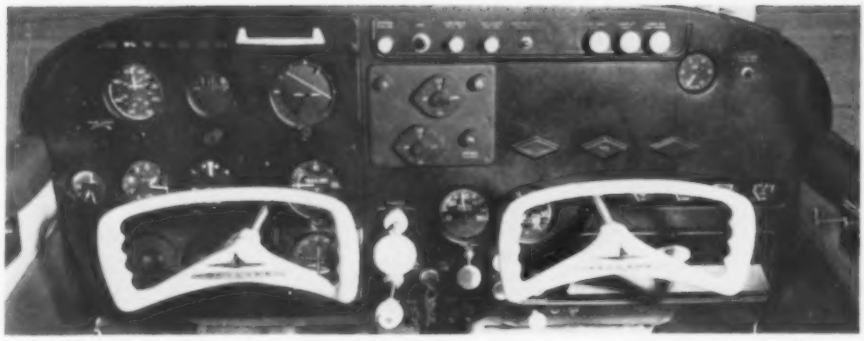
Model 172 and Skyhawk

Increased useful load, redesigned wingtips and speed fairings and an optional fifth seat of 120-lb. capacity to fit into the baggage compartment are features of the 1962 Model 172 and its deluxe version, the Skyhawk. Both are powered by a 145-hp. Continental engine.

Gross weight increases provide the 172 with a 990-lb. useful load, up from 949 lbs. in the previous model, and the Skyhawk with a 920-lb. useful load, up from 880 lbs. in the previous model. The 172 tops 139 mph. and cruises 131 mph. on 75% of power and the Skyhawk tops 140 mph. and cruises 132 mph. With 39 gals. of fuel and no reserve, the 172 has a 535-mile range at 131 mph. and the Skyhawk has 540-mile range at 132 mph., while both have 780-mile range at 100 mph.

New low-drag wingtips and speed fairings are interchangeable on Cessna Models 150 through the 180 series.

New optional 6-way adjustable pilot-copilot seats adjust for forward and rearward, back tilt and vertical height, providing greater pilot-passenger comfort. Optional headrests are available. Ten two-color combinations are available for both airplanes, the 172 having two-color striping while the Skyhawk is fully painted. Polycloud seat fabrics are in brown, blue and green, with foam-padded carpet of beige, and light tones are used for Royalite and Elastolex sidewalls, bolsters and headliners. Optional equipment includes the new $995 Nav-O-Matic autopilot, and new pictorial horizon and directional gyro system ($660 in the 172 and $265 in exchange for the Skyhawk). The Skyhawk's standard equipment includes engine-driven vacuum system with artificial horizon and directional gyros, turn and bank, rate of climb, sensitive altimeter, clock, outside air temp, wheel pants (speed fairings), wing-strut fairings, landing and taxi light, sun visors, tow bar and navigation light flasher. The Skyhawk's "D" engine is the same as the 172's "C" engine except that it provides for a push-button starter and vacuum pump drive. Both models are available as floatplanes.



Model 150 "Eyes-on-the-Road" instrument panel has flight and navigation instruments directly in front of pilot on shock-mounted sub-panel, radio equipment in center, engine instruments stacked vertically to right of radio. Included as standard equipment are variable intensity panel flood lights, map compartment and audible stall warning indicator.

Nearly 5,000 Cessna 172's have been sold since the model was introduced in 1956.

New Skylark

A $350 price increase for the $14,125 Skylark provides for a new 84-in. constant-speed propeller and other refinements as standard equipment. With 175-hp. geared Continental engine, the Skylark has a top speed of 150 mph. and cruises 142 mph. on 75% of power. With 41.5 gals. of fuel and no reserve, it has a 550-mile range at 142 mph. and a 720-mile range at 104 mph. Useful load of 1,040 lbs. is 85 lbs. more than formerly.

The new constant-speed prop automatically changes pitch to maintain selected rpm., utilizing boosted hydraulic oil from the engine. Also new are slit-type cowl flaps for precise control of engine temperatures. The Skylark also has the new low-drag wingtips and speed fairings and its windshield contour has been flattened for more efficient streamlining. New magnetic fuel level gauges reflect variations instantly.

Three interiors feature color combinations of green, brown and rust in fabrics, fawn Elastolex and beige foam-padded carpet. Exterior paint is available in ten two-color combinations.

New optional equipment includes: The new $995 Nav-O-Matic autopilot, new natural-reading pictorial horizon and directional gyro ($265 on exchange basis), new 6-way pilot and co-pilot seats and headrests, and a fifth "family" seat of 120-lb capacity in the baggage compartment.

Available as optional equipment for the first time in the Cessna Anniversary Fleet are the pictorial horizon (left), directional gyro (center), and Cessna Nav-O-Matic autopilot. The pictorial horizon and directional gyro sell as a system with a one-year warranty for $265 exchange. The autopilot, a single-axis unit, has a self-contained gyro, weighs 9.5 lbs. installed and sells for $995.

The experimental Piper wing pictured above is of single-piece construction and has no ribs. It was built from vacuum-reinforced polyester, and was among a number of new developments unveiled at Piper's sales conference. Construction of the 25-ft. wing is one of several fabrication techniques under study at the company's development center at Vero Beach, Fla.

Piper Sales Meeting

Introduction of the new Piper Aztec B and the all-leather "Palm Beach" interior for the Piper Comanche 250, announcement of a $60 million sales goal for 1962, and presentation of sales awards for 1961 highlighted Piper Aircraft Corporation's 22nd annual International Sales Conference held at West Palm Beach, Fla., Nov. 7-9.

Some 850 Piper representatives from all 50 states and several foreign countries arrived in 225 Piper aircraft and by commercial transportation for the conference at the George Washington Hotel.

General Sales Manager J. W. Miller stated that 1961 was the third largest sales year for Piper and set a $60 million sales goal for 1962 and a $66 million goal for 1963. He also said that Piper export sales for 1961 rose from $6 million to $7 million.

Along with the Aztec B were presented the Comanche 180 and 250, Cherokee, Colt, Pawnee and Super Cub. Among major Piper developments introduced was an experimental vacuum-formed reinforced polyester wing, unveiled by Howard Piper, vice president of research and development.

Representatives from Piper concerns with sales exceeding $1 million for 1961 receive "Million Dollar Club" plaques, above. Winners were Baker Aircraft Sales, Long Beach, Calif., Tufts-Edgcumbe, Elgin, Ill., Hillsboro Aviation, Hillsboro, Oregon, Central States Aircraft, Ogallala, Neb., Ross Aviation, Tulsa, Okla., Lucci Aircraft, Sarasota, Fla., Safair Flying Service, Teterboro, N. J., Des Moines Flying Service, Des Moines, Iowa, Jonas Aircraft, New York, N. Y., Vigors Aviation, Oxford, England, and Trans Aircraft of Hamilton, Ontario, Canada. Below, representatives from Piper organizations join "Top Hats" for top sales. In order of units sold in 1961 are Baker Aircraft, Hillsboro Aviation, Central States Aircraft, Lucci Aircraft, Tufts-Edgcumbe, Wes-Tex Aircraft Sales, Lubbock, Tex., Des Moines Flying Service, Central Piedmont Aero, Winston-Salem, N. C., Aerodynamics Inc., Pontiac, Mich., Jonas Aircraft, Trans Aircraft and Vigors Aviation.

President William T. Piper (center, below) dons tribal headdress with some of company's top salesmen during awards banquet.

Needed: A Third Level Of Air Service

Part V

By E. H. PICKERING

WHO will be the passengers that will use third-level airlines? For the "classic" type of third-level airlines, whose services will radiate from a central major city to outlying communities, it is reasonable to assume that most travelers will be moving into or out from the central hub. Relatively little traffic can be anticipated between pairs of the smaller cities served. This is generally true for all airlines, and may prove even more true for third-level operators.

Probably the largest group of passengers will be those people presently traveling by air who have been using surface means to and from the nearest practical airline service. A second source will be those travelers who have been making their entire trip by surface in preference to joint surface-air complexities. A third source will be those traveling between two points only on the third-level system — principally to and from the hub city as commuters. The distribution of passengers among the three categories will vary for each pairing of points but, in general relationship, will probably follow the order listed above.

If these beliefs prove to be true, there will be a demand placed upon third-level airlines for more service than just operating airplanes on schedule. Passengers making a journey involving use of two airlines must have assurance of confirmed reservations on both airlines. Such passenger service requires a reservations system in close contact with the reservations departments of other airlines plus a dependable communications system between all stations of the third-level airline plus a manned telephone at each station covering as many hours of the day as possible.

Reservations and Communications

Just to provide the manpower to handle such a reservations-communications service may require more personnel than those needed to dispatch, fly and maintain the airplanes.

For a third-level airline serving one major airline junction point and several satellite towns, a central reservations control at the major city will be required. Such a control center must be manned from early morning to late evening. It will handle requests for space on the third-level flights and will request continuing reservations on trunk and/or local service airline flights out of the junction point.

To perform effectively, the personnel in reservations control must be experienced (hired from other airlines) or properly trained by experienced persons. To *quickly and accurately* quote schedules and fares, control space, request reservations and confirm back to the requesting station is an ability not easily attained. The large airlines train new personnel for several weeks, and it may be years before full responsibility is placed upon them.

Why is a reservations system so important? Place yourself in the position of Businessman Jones, in Falls City, Nebraska, who decides at 3 p. m. that he must be in St. Louis by 11 a. m. the next morning. He has no train service available and bus service does not appeal to him. He can leave right away and drive to St. Louis, arriving about midnight (thoroughly tired). He can phone the airlines at Kansas City for a reservation to St. Louis, rise at 4:15 a. m. and drive to Kansas City, park his car at the airport, and fly to St. Louis. Or, if a third-level airline served Falls City, he could call their local number, make a through-reservation and leave Falls City at the respectable hour of 8 a. m. connecting to TWA 86 from Kansas City to St. Louis. However, if the third-level airline has no way of confirming his combined reservations in a matter of minutes, then, to be sure of being on time for his appointment, he must resort to driving.

Or take Aunt Minnie, wanting to visit Cousin Elmer and the kids in Denver. If she can't let them know exactly when she is due to arrive at Stapleton Field so they can meet her, maybe she won't travel at all.

Or consider Jimmy, a sophomore at college, home for the weekend. If he's not sure of a reservation to get him back for class on Monday morning, then he'd better start driving — and will.

But a reservations system rests entirely on a dependable, efficient communications system — the ability of a station to promptly put through a request to reservations control at the main base and get a quick reply. Such a communications system can also be utilized for aircraft dispatching and general point-to-point messages.

For assistance in finding ways and means to economically provide a ground communications system, we called on Carl Fox of Associated Radio at Dallas' Love Field (specialists in HF and VHF aviation radio), Communications Engineering Co. of Dallas (specialists in FM systems) and Southwestern Bell Telephone. All had suggestions and cost figures to offer, and each can provide services tailored to meet varying needs. It was immediately apparent that no one system will fit the many possible variations in distance, terrain, time coverage, and frequency of message demands that individual third-level operations might require.

The leased line teletype systems used by the airlines, trunk and local, appear too expensive for most potential third-level airlines. Monthly charges of $1.45 per mile (between stations by straight line mileage) plus rental charges for each machine would eat up the profits of short-haul transportation except in a few high-density traffic markets.

Teletype machines tied into a common system (TWX) are closer to the economic capabilities of these small airlines but still costly at $10 per month per machine and costs of about 40¢ per message over distances of 150 miles (about half the cost of a long distance phone call).

Teletype has the distinct advantage of providing a written proof of the exact message sent and received to settle differences of recollection and sometimes to place the blame for mishandling. Where teletype is too costly, other means must be found.

One possibility for operators of five to ten outlying stations might be found in a new Bell Telephone service designated WATS, and best described as Wide-Area Telephone Service. WATS permits a company to "buy" unlimited outgoing long distance telephone calls for a fixed monthly charge. Cost of coverage for an area such as the entire state of Texas is $850 per month. A central reservations control office can call each outlying station at fixed times (such as 5 minutes after the hour and 25 minutes before the hour), accept all reservations requests received by each station in the past 30 minutes, call each succeeding station, take a break to handle all of the continuing reservations so collected, then call back to each station with confirmation or denial of their requests and accept additional requests, thus starting the process all over again. Such a system

(Continued on page 78)

Scheduled Skyways' Ticket To Success

Passengers disembark from one of Ray Ellis' Piper Apaches after trip from Fayetteville to Little Rock, above. Below, small packages and newspapers are also carried to add to Scheduled Skyways' gross revenues.

—(FLIGHT MAGAZINE Photos by E. H. Pickering.)

"IT'S the service we give, not the name of the airline or the size of planes, that attracts the business." So says Ray Ellis of Fayetteville, Arkansas, operator of Scheduled Skyways System, a real, live, third-level airline offering three daily round-trip schedules over the 140 miles between Fayetteville and Little Rock.

"Service, flexibility, frequency" are the theme that Scheduled Skyways has used in carrying 27,392 passengers nearly four million passenger miles on some two million airplane miles on 14,244 trips in the eight years between the first flight on September 1, 1953, and August 31, 1961.

This operation now uses twin-engine Piper Apaches carrying four passengers, supplemented by single-engine Cessna 182's as required. Service began in 1953 with single-engine Cessna 170's. First twin-engine Apache service began in 1958.

Scheduled Skyways was started to augment the services of Ellis' Fayetteville Flying Service, a fixed-base operation for 21 years engaged in aircraft sales, service, charter, instruction and forest patrol. The scheduled operation now produces 42% of Ellis' gross revenue. Scheduled Skyways is a free-enterprise, non-subsidized operation depending entirely upon commercial revenues to justify its existence.

Geography plays a major part in making this airline possible. Two hundred miles of winding, mountainous, Arkansas roads face the highway traveler between Fayetteville and Little Rock. No rail service is available. In contrast to the four-hour driving time, Scheduled Skyways flies the 140 air miles in 55 minutes.

Prime factor in airline traffic over the route is the location of the main campus of the University of Arkansas at Fayetteville with the medical school and extension division located at Little Rock, the state capital. The Fayetteville area's diversified manufacturing (Daisy Air Rifles, Campbell Soups, Standard Register, Baldwin Pianos, Kearney Electric, Bear Brand Hosiery and a large poultry raising industry) contributes a solid economic foundation for about 50,000 population.

All has not been beer and skittles for Scheduled Skyways, however. In its second year of airline operation, the CAB certificated Central Airlines, a local service carrier, to serve Fayetteville (Ray Ellis was a witness for Fayetteville in the case, urging the award to Central as advantageous to the community). Central operated DC-3's between Fayetteville and Little Rock in comparison to the single-engine Cessna's of Scheduled Skyways, but Central was required to stop at Fort Smith and Hot Springs while Skyways flew non-stop.

For the next year (1955) Scheduled Skyways' traffic was below the pre-Central era by about 7%. Then it rose to new heights each year through 1959. In 1960, Central was certificated to operate Fayetteville-Little Rock non-stop. Again Scheduled Skyways' traffic dipped, but this time only

2%, and the latest two months (August and September) are each above the level of the same months in 1960.

Ellis believes that his services and those of Central are complementary — each aids the other and together combine to form a well-rounded service pattern in the direction of Fayetteville's heaviest traffic flow.

Why does Scheduled Skyways traffic stand up so well despite Central's two daily round trips in the same market? Ellis believes it is due to maximum dependability and more frequent schedules timed to meet the specific demands of Fayetteville-Little Rock traffic.

Maximum dependability springs partially from the fact of turn-around service with Skyways' Apaches not subject to weather or other delays at points beyond the Fayetteville-Little Rock route, and partially from Skyways' courtesy policy of warning reservation holders well in advance when anticipated weather makes operations questionable. Furthermore, the flight cancellations that do occur do not strand Skyways' passengers, for Skyways protects its passengers and cargo by providing car and driver for surface travel to their destination. This service is of maximum value when the passengers are handicapped persons, such as the more-than-occasional blind or crippled children that ride this small airline. Scheduled Skyways has blanket insurance coverage for its users to cover both forms of travel.

Above, Ray Ellis checks latest weather sequence before dispatching a flight to Little Rock. Mrs. Ellis, below, books two passengers for a flight to Little Rock. Mrs. Ellis is also chief reservationist and company bookkeeper.

—(FLIGHT MAGAZINE Photos by E. H. Pickering.)

Only twice in going-on-nine-years of operations has Ellis' airline failed to deliver passengers or cargo by either air or, on occasion, by car, once a flight was cleared. Those times a sudden severe blizzard closed both airway and highway, causing passengers and pilot to spend the night in Little Rock.

With such a tightly controlled operation, mechanical delays and cancellations are so infrequent as to be practically non-existent. In eight years and almost two months, out of over 17,000 flights scheduled for operation, only one flight has been cancelled for mechanical reasons and delays for mechanical reasons have a cumulative total of less than 12 hours.

Scheduled Skyways has never injured a passenger. Since its start in 1953, three unscheduled precautionary landings have been made for mechanical reasons. All three were on airports. On the Fayetteville-Little Rock route an airport is never more than 20 miles away, and all but one of these airports are paved.

Ray Ellis maintains a more complete set of statistical records on his scheduled operations than most airlines do, large or small. Any question can be answered by reference to his fact sheets. He offers not only the answer to such a question as the year-by-year growth in passengers per departure (from 1.70 in 1953 to 1.71, 1.55, 1.60, 1.64, 2.02, 2.26, 2.28, and to 2.37 in the first eight months of 1961) but also the complete background data by years, months, days, and individual flight.

Says Ellis, "In order to get the maximum utilization of our aircraft and our personnel, we depend on our records. Every decision we make is based on facts, not guesswork. We use this data to determine what days off can be given to employees (Saturday, Sunday and Monday are days with below-average passenger demand), when vacations can be scheduled (December, January, February, June and July are months with below-average passenger demand), sources of traffic (every passenger by name and address is recorded with the cumulative number of trips made), weather cancellation expectations (16% in winter, 1% in summer, year-round average 8%).

From his records, Ellis knows that 75% of his traffic is local and 25% is interline connecting at Little Rock; that he gives the airlines 56% of the interline traffic and receives back 44%, that 52½% of his passengers are commuters completing a round trip in a day, that 20% are women, that 86% of his Fayetteville area passengers have Fayetteville addresses, and 14% are from surrounding towns (Springdale, Rogers, Bentonville, Decatur, Siloam Springs), that only 20% are Little Rock residents as compared to 80% from the Fayetteville area, and that his passenger manifests read like an Arkansas "Who's Who" with names of Senators, Governors, Congressmen, University presidents, ambassadors, coaches, and Miss Arkansas, as well as business, professional and civic leaders.

Because of the predominant amount of local (non-interline) travel, Scheduled Skyways can avoid the normal communications and reservations problems. Reservations are taken by the Fayetteville office and in Little Rock by the Avis car rental desk where the airline has its phone. Future reservation cards are made in duplicate and exchanged between stations by the pilot on each flight. Interline reservation requests are handled the same way where time is no element, or by long distance phone call if time is essential. The Fayetteville office is manned from 6:30 a. m. to 6:30 p. m. daily. The Little Rock office from 8 a. m. to 10 p. m. daily.

Of his Piper Apaches, Ellis says that they do him a fine job. Asked if he would redesign the Apache in any way for his specific use, Ellis says that Piper has already made most of the desirable changes in later models.

Ellis employs five pilots who average about 85 hours a month in combined operations — both scheduled and in other activities of his Fayetteville Flying Service. In instrument conditions, a co-pilot is assigned, otherwise all VFR is done with a single pilot.

How does the traveling public react to his small airline and small planes? Ellis does not recall ever having a passenger refuse to ride after encountering either the single-engine Cessnas or the Apaches. Once accustomed to the smaller planes, the passengers seem to enjoy them, especially the women.

As the most telling accolade for the light aircraft, Ellis' records show at least seven aircraft sales directly traceable to first flights as passengers on Scheduled Skyways.

"We depend chiefly on word-of-

(Continued on page 78)

GROWTH YEAR FOR HELICOPTERS

(Continued from page 53)

copter in Japan under license for commercial and military customers. A military version, designated the HRB-1 Sea Knight, has been chosen winner of a design competition for a U. S. Marine Corps assault transport helicopter. Beside military and airline applications for the 107, Vertol is actively promoting utility versions of the helicopter for use by the petroleum and logging industries.

Vertol also received a U. S. Army order for 18 HC-1B Chinooks during the year.

Brantly

Brantly Helicopter Corp., makers of the lowest-priced two-place helicopter on the market, have produced their 166th B-2 and have stepped up production to 12-14 helicopters a month. 130 of the $19,950 machines will have been built during 1961, and 240 are to be produced in 1962. According to Brantly's new sales manager, Jay C. Roberts, the company also plans to increase its number of distributors from 29 to 49, and to appoint foreign distributors. Roberts reports that 40% of all B-2 flying is for private or sport purposes. He said the 1962 machine has new blades for better auto-rotation and that floats are to be the next accessory.

Republic

Biggest news at Republic Aviation is the installation of the new AiResearch Model 331 turbine engine in their Lark helicopter. The Lark, an American counterpart of the French-built Alouette II, previously mounted a Turbomeca turbine. The new AiResearch turbine, which has a power rating of 500 hp. and a dry weight of 200 lbs., is 70 lbs. lighter than its Turbomeca counterpart and according to Republic, burns only 28 gph., compared to the former engine's 45-50 gph. On initial flights the Lark climbed at 2,000 fpm. to an altitude of 11,000 ft. Installing the turbine in the test machine took only two-and-one-half weeks. (See "New Turbine for Helicopters," page 47.)

Cessna

Cessna Aircraft, first and only fixed-wing manufacturer to enter the rotorcraft business, is putting present emphasis on the establishment of international field sales and service facilities for its $79,960 four-place CH-1C Skyhook. The company has established a special section in its Air Age Education and Training Dept. for the training of Skyhook flight and maintenance personnel, including in the section a $17,000 full-scale cut-away version of the Skyhook. A dealer introduction program is underway, and two flight and service teams are covering future Skyhook sales outlets in the eastern and western halves of the U. S. Since Skyhook deliveries began last August, eleven have been delivered and present production rate is about two a month.

Skyhook sales personnel are Frank Brown and Roland Maier; service personnel are Angelo Marasco, Harold Farthing and Bob Carter, and Ed MacKenzie is in charge of flight training.

Airmen's Calendar

Dec. 18—25th Wright Brothers Lecture, Natural History Bldg., Smithsonian Institution, Washington, D. C.

Jan. 21-24—Annual Meeting, Helicopter Association of America, Marriott Motor Hotel, Dallas, Tex.

Jan. 22-24—30th Annual Meeting, Institute of Aerospace Sciences, Hotel Astor, New York, N. Y. Honors Night Dinner, Jan. 23.

Feb. 14-16—International Solid-State Circuits Conference, Institute of Radio Engineers, Sheraton Hotel and University of Pennsylvania, Philadelphia, Pa.

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Marketing Pays Off For Narco

The 13-lb., $2,500 Narco UDI-2 DME (distance measuring equipment at top of page) weighs and costs half as much as original UDI of six years ago. $1,695 Mark 10 (center picture) consists of a 360-channel transceiver and a 190-channel nav/comm receiver. Mark 7 (left) is an 11-lb., $1,195 transceiver with 360 channels and 50 kc spacing.

DESPITE the leveling off of new airplane sales in 1961, as compared with deliveries in 1960, the aviation electronics business continues its upward swing. This trend points up the desire on the part of airplane owners to upgrade their communications and navigation equipment.

For example, the largest sales volume ever chalked up in one month by the National Aeronautical Corporation of Ft. Washington, Pennsylvania, was recorded last August. Narco delivered over $1 million worth of equipment during the month, following on the heels of its biggest July in history.

While such growth also holds for several other manufacturers, it certainly is not pure happenstance. Narco's product line in the broad range of medium to low-cost equipment is partially responsible but Narco's executives will tell you their individualistic marketing methods have a lot to do with it. The company markets through a few wholesale jobbers to 340 "preferred" retail outlets and thence to over 1,000 dealers. Most other concerns have direct factory dealers.

During a visit to the Narco factory last month we asked Gil Quinby, vice president for sales, if his company was as confident as ever in their system of distribution. The answer was an unqualified "yes."

"Our system is based on the proposition that general aviation will continue to grow — not recede," he told us. "Our whole program is based on this confidence — heavy engineering investment in new products, constant expansion of production facilities and a program designed for maximum profitable sales and service availability."

"No one has all the answers in marketing," Quinby continued."Times change and Narco intends to keep up or stay ahead of changing conditions. Our sales records appear to prove that continued improvement of our product line and a marketing program based on definite and tangible increases in aircraft utilization for business and pleasure are both realistic and productive."

The essence of Narco's marketing policy is to provide better lines of supply and communication to more retailers and customers through carefully selected wholesale bases. "These wholesalers perform the vital supporting services to our retail outlets far more effectively than we could as a factory-based direct dealer operation," Quinby believes, citing the present marketing of Distance Measuring Equipment now back-ordered for several months. The DME line has just started rolling with about seven a day scheduled and production to be boosted as indicated by demand. The backlog situation on DME is an example of the importance of the wholesale function. With Narco's production sold out months ahead, wholesale inventories are being carefully managed to assure equitable distribution and even immediate availability, if necessary.

DME is definitely the big news at Narco these days. Since Pilot Joe Doaks needs to measure distance as well as know his direction, which VOR gives him, Narco strongly believes that DME business in the 1960's will exceed the VOR business that really made the company in the 1950's.

Narco has an eight-year experience lead in DME due to its original development work and actual production on the old original model prior to the TACAN rhubarb a few years

back which resulted in the compromise VORTAC system now established as the "common" system for all users, including the military. But now that the argument is settled, the long-interrupted DME lines are rolling again. There's little doubt but that Narco will play their long lead in low-cost DME for all it's worth. Already in the mill is a remote control version for 1962 deliveries. All kinds of DME versions are contemplated, though no bearing adapter for TACAN is in sight at this time.

The UDI-2 DME developed by Narco under an FAA contract similar to the development interrupted by the TACAN dispute, weighs but 13 pounds. With less than half the weight of the old original, it is also just half the price — $2,500 as compared with the $5,000 price tag of the UDI-1 of six years ago.

By January 1, 1964, FAA is proposing that all aircraft above 12,500-pound gross weight be DME equipped. While this covers all airline equipment and all the larger executive aircraft, it's apparent that the serious business owner of aircraft under the 12,500-pound category will go modern and install DME. The word is getting around mighty fast as to the advantages of DME, which include:

Continuous position indication. With bearing indicated by VOR and distance by DME, the pilot knows exactly where he is at all times.

Positive groundspeed check. Exact winds-aloft conditions can be quickly determined, groundspeed accurately established.

More accurate estimates. Dead-reckoning IFR position estimates are eliminated for there's no guess-work with DME.

Easier holding patterns. Holding at intersections with DME and VOR is much easier and more accurate than now possible with dual VOR.

Orbiting. By flying a fixed distance from a VORTAC station, the pilot can follow an accurate circular flight path useful in approaches and in circum-navigating heavy traffic en route.

Expedited Approaches. Many instrument procedures now permit straight-in approaches for aircraft with DME and this trend will increase, eliminating time-consuming procedure turns and holdings.

Another hot item at Narco is the VOA-3A omni converter. When coupled with the new Narco Mark 10, consisting of two VHF receivers and a VHF transmitter, the owner has an ideal basic radio package with VHF navigation — omni and ILS localizer — plus the ability to communicate simultaneously on any of 360 50-kc crystal-controlled frequencies without interrupting navigation service. One Mark 10 transmitter is teamed with one of the two receivers to transmit and receive from 118.00 to 135.95 megacycles. The other receiver provides 190 frequencies between 108.0 and 126.9 megacycles.

If a full 2½ system is desired, a Mark V (190-channel receiver and 90-channel transmitter) and an additional VOA-3A can be added. This entire rig occupies just two instrument panel cutouts and a panel space approximately 6 inches square.

For the "interim" nav/comm owner, Narco pushes the Mark 7 with 360 channels and 50-kc spacing. This unit weighs only 11 pounds and sells for $1,195. The big market on Mark 7 is the owner of an IFR-equipped airplane who lacks only the added convenience of 360-channel capability.

Also on the business-as-usual sales list is Narco's Omnigator and Superhomer equipment, which never seems to find a peer for the average VFR pilot — a sort of Post Toasties of the lightplane world. Omnigators will account for about 2,400 units and the Super for 2,700 in 1961. When you total the number of Mark V's with all the Omnigators and Supers you get a total of 50,000 units in service today. This is a tremendous sales accomplishment when you consider the active fleet of aircraft in the U. S. is only about 75,000.

After a lull, business is picking up with the ADF-29 and ADF-29R low-frequency sets retailing at the very low figures of $895 and $995 respectively. The marker beacon receiver, the MBT three-light, 75-megacycle unit is now available in a remote unit and is listed as the MBT-R, selling for $250.

As for a general aviation transponder (GAT), Narco has a tie-in with Hazeltine who, along with Wilcox, are the only active participants in this field. What happens in this area, according to Narco spokesmen, will depend a lot upon the Project Beacon report, as Federal policy will have much to do with developments in this area. Originally they were talking of a simple device for improving target identification. Now there is talk of a more elaborate type of equipment with beaconry and altitude and identification coding.

There is no doubt but that Narco, no matter what the so-called "environment" might encompass, will remain a major factor in aviation electronics, especially in the general aviation field upon which it has built a successful career during the past sixteen years. Even though many of its developments were in the pioneering end of the game, calling for extra efforts and expenditures of talent and money with no promise of profit, every major product development has paid off. The same faith in utilitarian aviation that characterized the early years of Narco after VJ day is still very much in evidence at the modern Fort Washington plant as witnessed by DME and other developments.

It is interesting to note that Narco's net profit for the calendar year of 1961 will probably be one and one-half times the total sales volume of 1951! Net earnings for the first half of this year amounted to $267,000 after taxes. Total sales in 1951 — just ten years ago — were $380,000. They are well along to a new high gross sales figure of just under $7 million for 1961. — G.E.H.

New interiors in Procter & Gamble's three DC-3's (two are shown at right) were fabricated to match furnishings in the firm's Grumman Gulfstreams (two photos left) by Executive Aircraft Service, Redbird Airport Branch, Dallas. Nelson U. Rokes is Procter & Gamble's chief pilot.

Aztec B For '62

The new elongated nose on Piper's 200-mph. twin holds 150 lbs. of baggage.

THE new Piper Aztec B is bigger and more versatile than ever. With a new baggage-carrying nose and seating for up to six passengers, there's more room to hold payload and greater ease in loading it. Price for the 205-mph. twin remains at $52,900, despite the improvements. Useful load has been reduced by 125 lbs., however, due to added nose and seat weight.

With 17.5 cubic feet of baggage space in the new stretched nose and 20.5 cubic feet in another luggage compartment behind the cabin, an operator can easily load 300 pounds of baggage — and come out with a properly distributed load. Last year's baggage allowance was only 150 lbs. Another definite advantage of the Aztec B is that its rear baggage compartment does not double as a jump seat area for passengers, as is the case with many light twins.

Versatility also abounds in the generous cabin, which measures over nine feet from fire wall to rear. If the Aztec B owner wants to load a maximum of cargo, he simply removes all but the pilot's seat and fills 80 cubic feet of cabin space. Useful load is 1,900 lbs. at 4,800 lbs. gross weight. For maximum passenger carrying, three rows of two seats each are installed. The two front and two middle seats are individually adjustable with three-position reclining backs. A new two-passenger "couch type" rear seat replaces last year's single rear seat and stretches the full width of the cabin.

Two 250-horsepower six cylinder Lycoming engines driving Hartzell constant speed, full-feathering propellers power the Aztec B. A cruising

(Continued on page 81)

Large baggage door in Aztec's nose compartment measures 30.5 ins. by 19.5 ins. Nose provides 17.75 cu. ft. of payload space.

1962 Piper Aztec B

Factory Data

Price	$52,990
No. seats	6
Engine	Two (2) Lycoming O-540
Horsepower @ rpm.	250 @ 2,575
Gross wt., lbs.	4,800
Empty wt., lbs.	2,900
Useful load, lbs.	1,900
Useful pct. of gross wt., %	40
Fuel capacity, gals.	144
Top spd., mph.	215
Opt. cruising spd., 75% power at 7,000 ft., mph.	205
Cr. spd., 65% power at 10,000 ft., mph.	200
Cr. range, max. at 75% power, 7,000 ft., mi.	1,025
Cr. range, max. at 65% power, 10,000 ft., mi.	1,200
Cr. range, max. at 45% power, 10,000 ft., mi.	1,400
Stall spd., mph.	62
Rate of climb, fpm.	1,650
Best rate of climb spd., mph.	112
Single engine rate of climb, fpm.	365
Best single engine climb spd., mph.	110
Service ceiling, ft.	22,500
Absolute ceiling, ft.	23,750
Single engine service ceiling, ft.	7,500
Single engine absolute ceiling, ft.	8,800
Take-off run, ft.	750
Take-off run over 50 ft. barrier, ft.	1,100
Landing roll, ft.	900
Landing roll over 50 ft. barrier, ft.	1,260
Fuel consumption, 75% power, gph.	28
Fuel consumption, 65% power, gph.	24
Wing area, sq. ft.	207
Wing loading, lbs./sq. ft.	23.5
Power loading, lbs./hp.	9.6
Wing span, ft.	37
Length, ft.	30.1
Height, ft.	10.3
Prop diameter, in.	74
Baggage capacity, lbs.	300
Baggage compartment space, cu. ft.	38

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International Airport
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East Coast Flying Service, Inc.
Municipal Airport
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Executive Aircraft Company
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Ragsdale Aviation, Inc.
Municipal Airport
Austin, Texas

Southwestern Skyways, Inc.
Municipal Airport
Santa Fe, New Mexico
and Ogden, Utah

Sunny South Aircraft Service, Inc.
Broward International Airport
Fort Lauderdale, Florida

Walston Aviation, Inc.
Civic Memorial Airport
East Alton, Illinois

Wings, Inc.
Wings Field
Philadelphia 18, Pa.

Yingling Aircraft, Inc.
Municipal Airport
Wichita, Kansas

IMPROVED COMANCHE 250

(Continued from page 63)

toured seats, thick, rich carpets on the floor, and beige or gray fabrics, at the customer's discretion, to complete the decor. Space under the two front seats is fitted with a compartment, into which the pilot can tuck instrument approach manuals. Optional adjustable headrests and new individual pillows are also offered.

The Comanche has a laminar flow wing, swept tail and single-piece stabilator and cruises 181 mph., with a top speed of 190 mph. Ninety gallons of fuel, stowed in two 30-gal. main tanks and two 15-gal. auxiliary tanks in the wings, give the Comanche 250 a maximum range of 1,600 miles at economy cruise settings. A new fuel selector unit, with "press to test" feature, permits check of fuel in all four tanks without switching the selector. It was in a Comanche, laden with extra fuel, that Max Conrad set his international single-engine lightplane distance records.

Pictured below is the optional deluxe "Palm Beach" interior offered on the 1962 Comanche in two colors, beige or gray. Contoured seats are covered with genuine leather and padded with foam rubber, thick carpeting covers the floor. Note clear spaces under the front seats for instrument approach manuals. Interior costs $320 extra.

OMNI BREAKTHROUGH

(Continued from page 61)

energy into the navigation system. Instantly the pointers resumed their bearing and we were back in business on battery power. Because they are transistorized, these receivers need no warm-up.

To demonstrate an aircraft electrical system failure and use of the emergency power hook-up during an approach, Polansky switched from the aircraft electrical system to the dry cells as we crossed the middle marker during an ILS approach. This lost the glideslope, because it doesn't operate on dry cell power yet, but the localizer needle does and kept us aligned with the runway. We continued our approach at a constant rate of descent as if nothing had happened.

The remarkable little Dare package weighs only 5 lbs., uses no more electrical current than a small instrument

(Continued on page 80)

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ENCO
AVIATION PRODUCTS

THIRD LEVEL OF AIR SERVICE

(Continued from page 68)

is quite unhandy by the standards of larger airlines, but possibly quite practical for handling more limited reservation requests.

Reverting back to earlier days in the airline business, reliance might be placed upon the use of HF radio, possibly in the 3 to 5 megacycle range. These frequencies, once used extensively by the airlines, are gradually being abandoned in favor of VHF frequencies. Once, both ground-to-air and station-to-station messages were carried over the HF bands but, as station-to-station messages were taken over by teletype and long-line phones, and as ground-to-air came to use the more dependable VHF frequencies, HF is slowly being phased out. Aeronautical Radio, Inc., a jointly owned facility of all the airlines, controls most of the frequencies assigned to airline usage and can be expected to make HF frequency assignments to meet the needs of CAB certificated third-level airlines.

A recent development, designated SSB (Single Side Band) transmission greatly improves the quality of HF communications. SSB offers four times the signal strength for the same power output rating, is essentially immune from signal fading, and permits closer spacing of channel assignments. Both mobile and fixed SSB-HF stations of relatively low output can readily meet communications requirements for limited-area third-level airline needs.

As yet, no FCC or Air, Inc., assignments or rules for use of SSB-HF have been formulated. Only if a concerted demand arises is this system apt to be available for third-level airline use.

New midwestern regional sales manager for Dare, Inc., manufacturers of the Dare avionics line, is D. Donald Meshirer (right) pictured as he is introduced by Dare Sales Manager Elliott Polansky to Tony Aguilar (center), president of Associated Radio.

SSB may well prove to be the best answer to the flexibility needs of these small airlines. It is to be hoped that no action to eliminate its use will be taken while these airlines are in their formulative process.

The disadvantages of HF communications is the interference (static) effect of certain atmospheric conditions (electrical storms, etc.)and the relatively high cost of transmission equipment ($8,000 to $10,000 per station for HF-AM stations, but only from $2,000 to $4,000 for SSB-HF stations). For short range communication (up to 200 miles) SSB-HF will probably be usable well over 95% of the time. Too, ingenuity applied to purchase of second-hand equipment or adaptation of amateur gear could reduce the initial costs considerably.

VHF has the advantage of clarity of transmission, free from atmospheric and mechanical disturbances. On the other hand, VHF is line-of-sight, requiring high antenna towers to cover any practical distance for station-to-station messages (but excellent for normal-range ground-to-air usage). Even a high tower will find distances generally limited to about 50 or 60 miles for station-to-station transmission (possibly more under ideal conditions), and thus the need of an automatic "repeater" station and another tall tower (about 400 feet) to relay messages another 50 or 60 miles. This "repeater" arrangement also requires a second channel frequency assignment.

A VHF station would cost about $4,500 plus the cost of building an expensive tower or of renting the use of a local radio or TV tower. A "repeater" station would cost just as much as two other stations.

FM, while having most of the advantages of VHF, also has its handicaps, plus the lack of any FM frequencies presently assigned for aircraft or airline uses. FM equipment would cost less than VHF for short range usage, but much more for longer-distance coverage.

Any form of radio communication has the advantage of being subject to continuous usage without message charges, of permitting immediate conversational question and answer for clarification purposes, and freedom from service interruption by ice storms, hurricanes, floods, tornadoes, etc.

Use of telephone or teletype services has the advantages of being free from capital investment demands, and freedom from maintenance problems as service and repair are available on demand without charge.

Any form of communication will be a substantial expense, but a very necessary expense. Individual problems of frequency of demand, terrain, etc., will determine choice of means. Each situation requires a detailed study by experts to find the one method, or combination of methods, that gives the most practical service at the lowest cost.

SCHEDULED SKYWAYS SUCCESS

(Continued from page 70)

mouth advertising. Our passengers keep bringing us new passengers. We are too small to afford anything but some radio spot announcements, telephone directory, some direct mail, and occasional small ads in newspapers. It's our customers who keep us in business and bring us more business," is the way Ray Ellis sums up his Scheduled Skyways System.

MUSKETEER DETAILS

(Continued from page 60)

The design concept behind the Musketeer emphasizes simplicity, strength, piloting ease and low costs. Preliminary design studies began several years ago. Earlier this year, November was established as the target date for the Musketeer's first flgiht. But the Model 23 made its first flight on October 23 — three weeks ahead of schedule.

It is interesting to compare the Musketeer's design with that of the original Model 35 Bonanza, which was designed for high performance rather than simplicity. To do this, we hauled out a copy of the first Bonanza details released by Walter Beech in 1946. Here's how the 1946 Bonanza and the 1961 Musketeer "numbers" compare:

Original Bonanza price was $7,345 vs $12,000 for the Musketeer; horsepower was 165 vs 160, gross weight 2,550 lbs. vs. 2,300 lbs., and useful load 1,060 lbs. vs. 1,065 lbs.

The original Bonanza speed claims were 184-mph. top, 175-mph. cruise on 65% hp. and 46-mph. stall — as compared to the Musketeer's design performance figures of 146-mph. top, 128-mph. cruise on 65% hp., and 60-mph. stall. Rate of climb figures are the same — 700 fpm.

The Bonanza's wing area of 177.6 sq. ft. is 32.6 sq. ft. greater than the 145-sq. ft. wing area of the Musketeer, so that the Bonanza's 1946 wing loading was 14.35 lbs. per sq. ft. versus 15.85 for the Musketeer and its power loading was 15.45 lbs. per hp. versus 14.36 for the Musketeer. In span-length-height dimensions, the original Bonanza and the Musketeer compare as follows: 32 ft. 10 ins. vs 33 ft., 25 ft. 2 ins. vs 24 ft. 2 ins. and 6 ft. 6.5 ins. vs 7 ft. 4 ins.

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- Municipal Airport, Des Moines, Iowa
- Municipal Airport, Davenport, Iowa

GRAY AIRCRAFT SVC. CO., INC.
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HARTZOG AVIATION
Greater Rockford Airport
Rockford, Illinois

THE NORMAN LARSON CO.
PLANESERVICE, INC. (Service Division)
Van Nuys Airport, Van Nuys, Calif.
(Los Angeles Area)

PIEDMONT AVIATION, INC.
Smith Reynolds Airport
Winston-Salem, North Carolina

TEXAS AVIATION CORPORATION
G. K. Roberts, Pounds Field
Tyler, Texas

TOPEKA AIRCRAFT SALES & SERVICE
Municipal Airport
Topeka, Kansas

TRADEWIND AIRPORT CORP.
Tradewind Airport
Amarillo, Texas

TULSAIR DISTRIBUTORS, INC.
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Put Your BEECHCRAFT in BEECHCRAFT Hands

Western Navion of Long Beach, Calif., distributor for the Navion Rangemaster throughout eight western states and dealer for the Hughes 269A and fixed-gear Shinn 2150A, recently held its grand opening at Long Beach Municipal Airport. The ultramodern new sales and service center, worth nearly $250,000, encompasses more than five acres.

Kentucky recently made aviation history with the dedication of nine new public airports across the state in one day. Pictured above is one of the nine, the Taylor County Airport at Campbellsville. This airport, with a 3,000-ft. runway, cost $100,000, the state paying $60,000 and local funds making up the balance. The nine airports together are worth $1 million in State, local and Federal funds. Kentucky is presently spending about $500,000 yearly in airport construction and development, will dedicate three more airports very soon and "five or six" next spring. The one-day dedication effort was accomplished with a cavalcade of 15 airplanes on a 780-mile tour to the communities of Cynthiana, Olive Hill, Harlan, Campbellsville, Elizabethtown, Muhlenberg County (Central City-Greenville), Elkton, Murray and Fulton.

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Special silicone formula GLIDAIR 17-A Ice Repellent prevents ice formation on leading edges, antennae, struts and props. Just spray it on . . . polish easily to a smooth, hard, glossy surface.

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OMNI BREAKTHROUGH

(Continued from page 76)

lamp and takes no more space than two standard panel instruments — it needs no external power supply units, no external converters, no shock-mounts. Both the DR-480 receiver and the DNCI-1 meet FAA-TSO requirements. The receiver covers 480 channels with 50-kc spacing over the 108.00-131.95-mc range and features automatic glideslope channeling by selection of localizer frequency. Price of the DR-480 receiver is $1,050, the DNCI-1 VOR-ILS converter-indicator costs $945 and a DPC-480 power converter for 14 volt aircraft operation only is $50.

These are Dare's first solid-state units and Polansky said the company will introduce other solid-state equipment in the future.

AZTEC B FOR '62

(Continued from page 74)

speed of 205 mph. results at 7,000 ft. and 75% power. Top sea level speed is 215 mph. Fuel is carried in four 36-gallon tanks, two in each wing, for a total capacity of 144 gallons. A five-hour range is possible at maximum cruise or up to nine hours at economy cruise.

The Aztec comes in three versions, the Standard, Super Custom and Auto-Flite, the difference being in navigation and communication installations. The standard price of $52,900 is for a complete IFR-equipped airplane with the exception of radio. Standard equipment includes 144-gal. fuel capacity, full gyro instrument panel, dual generators, dual vacuum pumps, electric turn and bank, rotating beacon and heated pitot tube.

Navigation equipment for the Super Custom and AutoFlite versions consists of Motorola ADF-T12, transistorized automatic direction finder; a Narco Mark V combination 90-channel transmitter and 190-channel crystal-controlled receiver with VOR/ILS localizer receiver; a Narco Mark 10 combination 360-channel transceiver with a 190-channel crystal-controlled receiver and associated VOR/ILS localizer receiver. An optional Narco UDI-2 DME (distance measuring equipment) fits in the same compact radio stack. A three-light marker beacon receiver is also included in the navigation package.

Highly versatile Aztec B can be loaded with nearly a ton of cargo and one pilot, or six persons and 300 lbs. of baggage. Rear baggage compartment is entirely behind cabin.

The AutoFlite Aztec is equipped with the Piper AutoControl, a two-axis automatic pilot with gyro-controlled heading lock and automatic turn feature. The Piper AltiMatic triple-axis auto pilot with altitude selector and automatic altitude hold can replace the AutoControl as optional equipment.

A hydraulically-retracting tricycle gear with steerable nose wheel the same size as the two main wheels is used on the new Aztec. Flaps are hydraulically operated, and a one-piece all-moving "stabilator" is utilized in place of the conventional stabilizer/-elevator combination. Construction is all-metal with a welded steel truss section built around the cabin for added strength.

Four different three-tone exterior paint schemes are offered: Daytona white with combinations of Pontiac red and Dakota black, Phoenix tan and El Paso brown, Orlando green and Tampa green, and Lakeland blue and Newport blue. Wings, stabilator and fuselage are Daytona white in all combinations.

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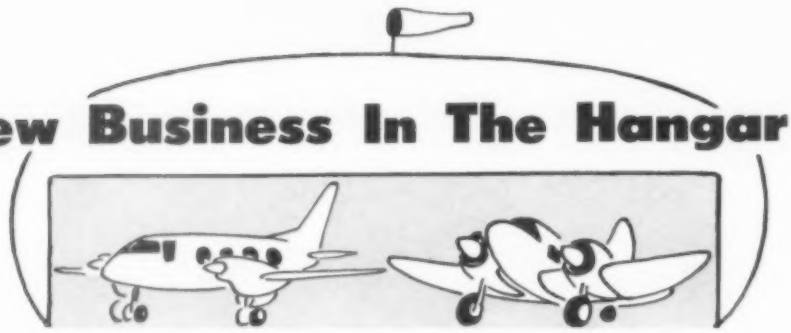


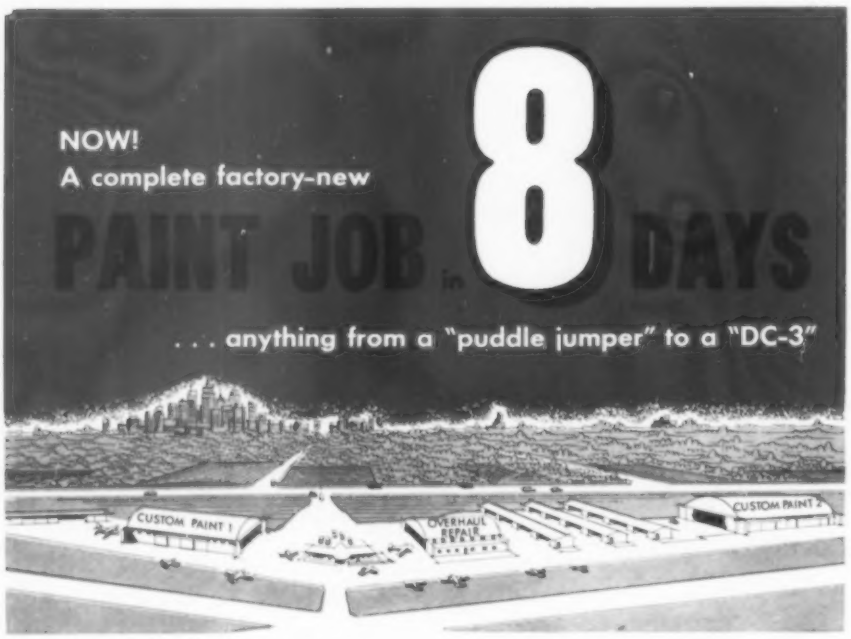
AIRESEARCH AVIATION SERVICE DIVISION, Los Angeles International Airport, delivered a third Grumman Gulfstream to the Martin Company. The airplane was equipped with an executive interior, dual Bendix VHF communication and navigation systems, dual glideslope, dual Bendix automatic DF, Sperry dual compass, Collins HF, Sperry SP-20 autopilot, Bendix RDR-1D weather radar, Collins ATC transponder, and exterior painting. Chief Pilot Will Smith accepted the airplane. . . . Frank Sinatra's Essex Productions, Inc., took possession of its newly redone Martin 404; appointments included electronic piano, tape recording, twinkling lights over the refreshment area and sliding window panels of varied design. . . . Chief Pilot Bob Olsen of National Lead flew in his firm's Gulfstream for installation of 200 amp. generator to modify its AiResearch auxiliary gas turbine power unit . . . also in the hangar were the Mobil Oil DC-3, brought in by Arch McGregor for custom exterior painting, and the John Mecom Convair, in for miscellaneous AD notes and other work.

PACIFIC AIRMOTIVE CORPORATION, Santa Monica, has received the third Piaggio from Norair Division of Northrop. The airplane was flown in by Max Stanley for interior work, installation of avionics equipment and exterior paint. . . . A. L. Rodriguez, La Jolla, Calif., took delivery of his Lodestar after installation of some Learstar modifications and partial interior refurbish. . . . H. W. Carroll's Chemical and Industrial Lodestar was modified to 22,000 lb. gross weight. . . . Bob Grey brought in the H. K. Porter Gulfstream for service work . . . and the Western Pipeline Gulfstream, with pilots Stan Nicola and Bill Reif, was also in for service work.

CALIFORNIA AIRMOTIVE, Burbank, modified the Paul Mantz Constellation 749A to a 90-passenger seating layout. Similar high density seating was installed in a 749A owned by Associated Air Transport, Inc. . . . Laramore Construction bought a Convair 240 from Cal Air for business and executive use. . . . Cal Air sold a Connie, with 90 seats, and leased a DC-4 to Standard Airways of Burbank. . . . Trans International Airlines brought in their Constellation 1049H for triple engine change and operation 7 check. . . . Associated Airlines, Inc. turned over their Constellation 749A for double engine change. . . . California Hawaiian Airlines leased a Constellation 1049A after the exterior had been painted to their specifications.

REMMERT-WERNER, INC., Lambert Field, St. Louis, did an 8,000 hr. overhaul on the Goodyear Aircraft DC-3 and installed Eonite control surfaces. Frank Caulkins, Dave Frott, and Arnold Walker are the pilots. . . . Charles Colgan's Adams Properties DC-3 was in for installation of a flushing lavatory and de-icer boots . . . the Super 92 DC-3 belonging to Oster Manufacturing had wing removal and attach angle replacement. L. V. Brandhorst is the pilot. . . . A double engine change, propeller overhaul and repaint was performed on the Ridge Tool DC-3. Joe Smith is the pilot. . . . Bob Brunelle's Livermore and Knight Super 92 DC-3 was flown in for double engine change, engine mount overhaul and magnaflux, and installation of cowl flap cinch kits. . . . The Forkey Brothers Auctioneers DC-3 was brought in by Bob Lukow for a Remmert-Werner radome installation . . . the IBM DC-3, with pilot Joe McClure, was received for installation of Collins WP-103 radar with R-W hinged radome, dual Bendix isolation amplifiers, Leland inverters, Flight System, new instrument and radio panels, complete radio and electrical rewiring, new ice lights, new interior, galley, and lavatory with flush toilet, new exterior repaint, control surface re-cover, and other work. . . . Pickands-Mather's DC-3 had wings exchanged, doubler replacement, and installation of Sierracote heated windshield. Art Zimmer and Fritz Buechling are the pilots. . . . Ralph Piper's Monsanto Convair received a Narco DME system.

AVIATION POWER SUPPLY, INC., Burbank, Calif., has provided R-985-APS-4 engines with 12:1 blower impeller ratio for the Gordon H. Ball Beech E-18S, piloted by Eddie Haapala, and for the Combs Aircraft G-185 Beech, brought in by Chief Pilot Fritz Hayes. . . . Operators of Beech Model 18 aircraft with R-985-APS-4 engines, who have recently added the APS 3-200 fuel injection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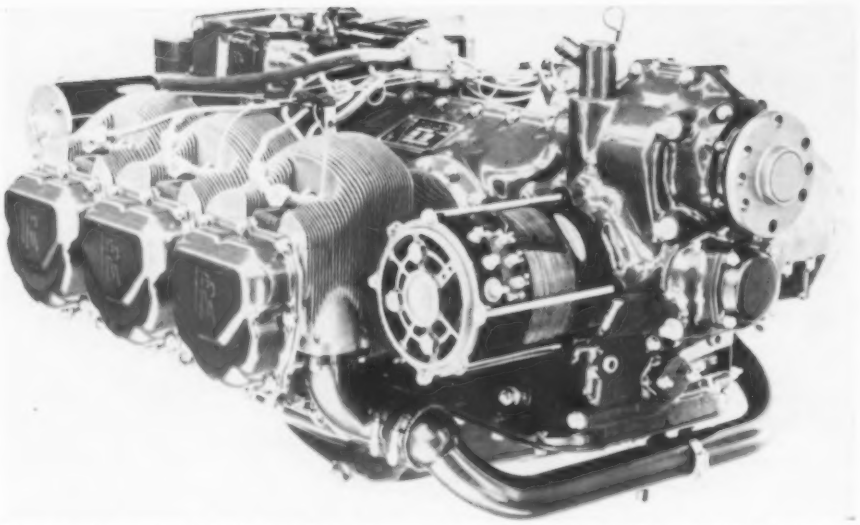

Continental engines built by Rolls-Royce, such as the 310 hp. GIO-470-A pictured above, will soon begin rolling off the English firm's Crewe production lines with first production deliveries to begin early next year. First airplanes to be Rolls-Royce Continental powered are likely to be those of the new English BEAGLE line, featuring modern high-wings and twins in the Cessna class.

system include Thiokol Chemical, Redstone Division, McCulloch Motors, and Frederick and Watson Construction. . . . Marvin Freeman's Marcona Mining DC-3, out of Lima, Peru, was supplied with two NTSO R-1830-94 engines on an exchange basis. . . . Other airplanes in the hangar for work include North American Aviation's DC-3, Robert A. Darnall's Johnson & Johnson DC-3, and Standard of California's Douglas A-26, flown in from San Francisco by Chief Pilot Art Walker.

HOWARD AERO, International Airport, San Antonio, made a radar installation in Better Industries' Howard 250 after it had been flown in by Chief Pilot Bernie Covington. . . . Virgil Koidahl of the Chun King Corporation was in to inspect progress on his company's Mark II Super Ventura. . . . Bob Myers of Panhandle Eastern Pipeline was in to inspect progress on their new Howard 350 now under construction. . . . Harry Carroll's Chemical and Industrial Lodestar was in for installation of Howard power packs and wheel well doors . . . also in for work was the Pauley Pan American Petroleum D-18, flown by Max Espinosa, Charlie Viosca's Anderson Dunham Howard 250, the National Steel Super Ventura, brought in by Bob Hamilton, Transcontinental Gas Pipeline's PV-1, turned over by Chief Pilot Bob Harlow, E. E. Dunsworth's Trunkline Gas Howard 250, International Mineral's Super Ventura, flown in by Bob Vinson, Bill Burke's Pure Oil Howard 500, Petan's Howard 500, piloted by Frank Reddin, and Don Bond and Bob Landacre, pilots for Celanese Corporation, had both of the company's Howard 250's in for work.

READING AVIATION SERVICE, Reading, Pa., received an Army H-21 helicopter for repaint . . . an FAA aircraft was brought in for double engine change and accessory and propeller overhaul . . . the Asplundh Tree Expert Cessna 310 was brought in by Mr. Asplundh for double engine and accessory overhaul, 1,000-hr. airframe inspection, and a new custom interior. . . . Bill Austin's Lukens Steel Aero Commander was in for installation of electric prop de-icers. . . . Other airplanes at Reading for work were the Federated Dept. Stores' Martin 404, piloted by Otto Pobanz, the Cy Musser Aero Commander 680F, Marvin Myer's Rish Equipment DeHavilland Dove, the Tasty Kake Baking Aero Commander, brought in by Jesse Enoch, the Montgomery Air Charter Dove, Tom Macario, Jr.'s Levitt & Sons DC-3, the Oneida Paper Products Aero Commander, flown by Hale Geiger, Dale Barnes' Dana Corporation Aero Commander, the Real Estate Service Bureau Aero Commander, brought in by Roy Hammond, Tom Laughead's Maryland Ship Building Aero Commander, the Starflite Lodestar, the Sharmex S.A. de C.V. Twin Bonanza, flown by Steve Negoescu, Richard Farr's American Casualty Aero Commander, Kurt Heilbronn's Philadelphia Evening Bulletin Lodestar, East Coast Flying Service's Martin 404, the Birchwood Lodge Piper Apache, and Roger Glass's Pa. Glass Sand Aero Commander.

PLANESERVICE, INC., Beechcraft Distributor at Van Nuys, Calif., has announced that they are now open seven days a week to take care of customers' maintenance needs. Planeservice says by having his aircraft repairs done over the weekend the businessman-pilot gets increased utilization during the week, and does not have to pay the customary premium rates for Saturday and Sunday maintenance.

SPARTAN AIRCRAFT COMPANY, Municipal Airport, Tulsa, Okla., received the Standard Oil of Ohio Lodestar from Chief Pilot Harry Seivers for a double engine change. . . . Work was also done on Mechanical Product's PV-1, Robert Combs' Baldwin Piano Beech E-18S, the Parker Pen DC-3, flown in by Richard Wickham, the Skelly Oil Beech 18, Frank Ernst's Franklin Supply DeHavilland Dove, the William Brothers' Douglas A-26, brought in by Andy Lockhart, Ed Thaggard's H. C. Price DC-3, the Flint Steel Beech E-18, flown in by Kenneth Nelson, Service Pipe Line's Lodestar, W. T. Gilliard's General Aerial Survey N/A 407, and the Reading and Bates' PV-1, brought in by Bob Little.

EXECUTIVE AIRCRAFT SERVICE, INC., REDBIRD AIRPORT BRANCH, Dallas, received Esso Tanker's newly-purchased Super Alli-

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son Convair for repaint and new interior. Esso's aviation manager, Col. E. W. Estelle, picked up the company's DC-3, which had received an engine change, fuel and oil system overhaul, new de-icer boots, control surface recovering, new paint, reupholter of interior, and other work. . . . Chief Pilot Nelson Rokes received the Procter and Gamble Distributing DC-3, which had new EAS interior, fuel and hydraulic system, and rework of the hot air system. P&G's third Douglas is in for the same work. . . . Oscar Williford, pilot for Gulf Oil, picked up his company's Gulfstar which was brought in for a paint job, new carburetor heat system, and minor interior repairs. . . . Ernie McGill's Bankers Life of Nebraska DC-3 was in for repaint and other work. . . . **LOVE FIELD BRANCH** did engine blade modification on the Union Producing Gulfstream after its being brought in by Chief Pilot E. P. Jeter. . . . Carl Lund's International Paper Beech D-18 was in the hangar for a periodic and engine change. . . . Frontier Chemical's Lodestar was handed over to Pilot Martin Weirauch after receiving overhaul of fuel valves and replacement of liquidometers. . . . Also in for work were the E. W. Brown, Jr. DC-3, brought in by Jim Smith and Ben Duhon, the T. D. Humphrey, Jr. D-18, flown by Stormy Roderick, the Pitts Industries' DC-3, Texaco's Grumman Mallard, the Offshore DC-3, Mead Johnson & Company's DC-3, and an E-18 belonging to Humble Pipe Line.

DALLAS AIRMOTIVE, INC., has noted a 63% increase in net income in the first half of its fiscal year on a 41% gain in sales. This represents earnings of $345,308, equal to 53¢ a share, compared with $215,770, or 33¢ a share for last year's first half. The Dallas firm recently received a $750,000 per year contract from Piedmont airlines to overhaul Martin 404 engines.

ASSOCIATED RADIO, Dallas, has opened a new electronics service and sales facility at Addison Airport. Jack Pinkston, formerly at Associated's Love Field shop, is in charge of the new facility.

PACIFIC AIRMOTIVE, Burbank, has appointed Earle V. Gardiner as avionics manager of the company's aircraft electronics operation. Previous to his joining PAC, Gardiner was assistant director of marketing for Tamar Electronics, Inc., Gardena.

QUALITRON AERO, INC., Burbank, did a wide variety of radio services on Bechtel Corporation's Gulfstream, with Chief Pilot A. K. Roden; miscellaneous work was done on the Hondo Oil and Gas Lodestar, brought in by John Lyon, and Shell Oil's PBY and DeHavilland. . . . The Long Beach Engine Rebuilders' Cessna 310 was in for radio and other work. . . . Walt Brownell's Morton Salt Lockheed Ventura was in for double engine change, prop overhaul, engine and instrument overhaul and other work. . . . Sears, Roebuck's DC-3 was brought in for new hydraulic lines and de-icer boots. . . . The Union Oil Convair 440 was in for interior work.

PIEDMONT AVIATION, INC., Winston-Salem, did miscellaneous repairs on an F-27 owned by the Noland Co. and piloted by Karl Styne. . . . E. M. Beattie's General Electric B-23 was in for repairs, as was a DC-3 owned by the R. J. Reynolds Tobacco Co. and flown in by Herbert Drew. . . . Work was also performed on the Federal Paper Board DC-3, with Chief Pilot Stanley Pierce, Joe Weatherly's Apache, the Dale Balzer Chatham Manufacturing DC-3, the American Enka E-18S and D18S, Julian Putney, chief pilot, Joe Culler's Krispy Kreme Doughnut Apache, and the Tidewater Construction E-18S, brought in by pilots Ed Miltz and Harold Spruill.

DALLAS AERO SERVICE, Love Field, received a Superior Airlines De Havilland Dove for wing modification. . . . John W. Fisher's Dove was in for 8,800 lb. gross increase. . . . The Mid-America Mineral Aero Commander was brought in for dual hydraulics. . . . Also in for work were the British American Oil Lodestar and the Estes Enterprises Cessna 310.

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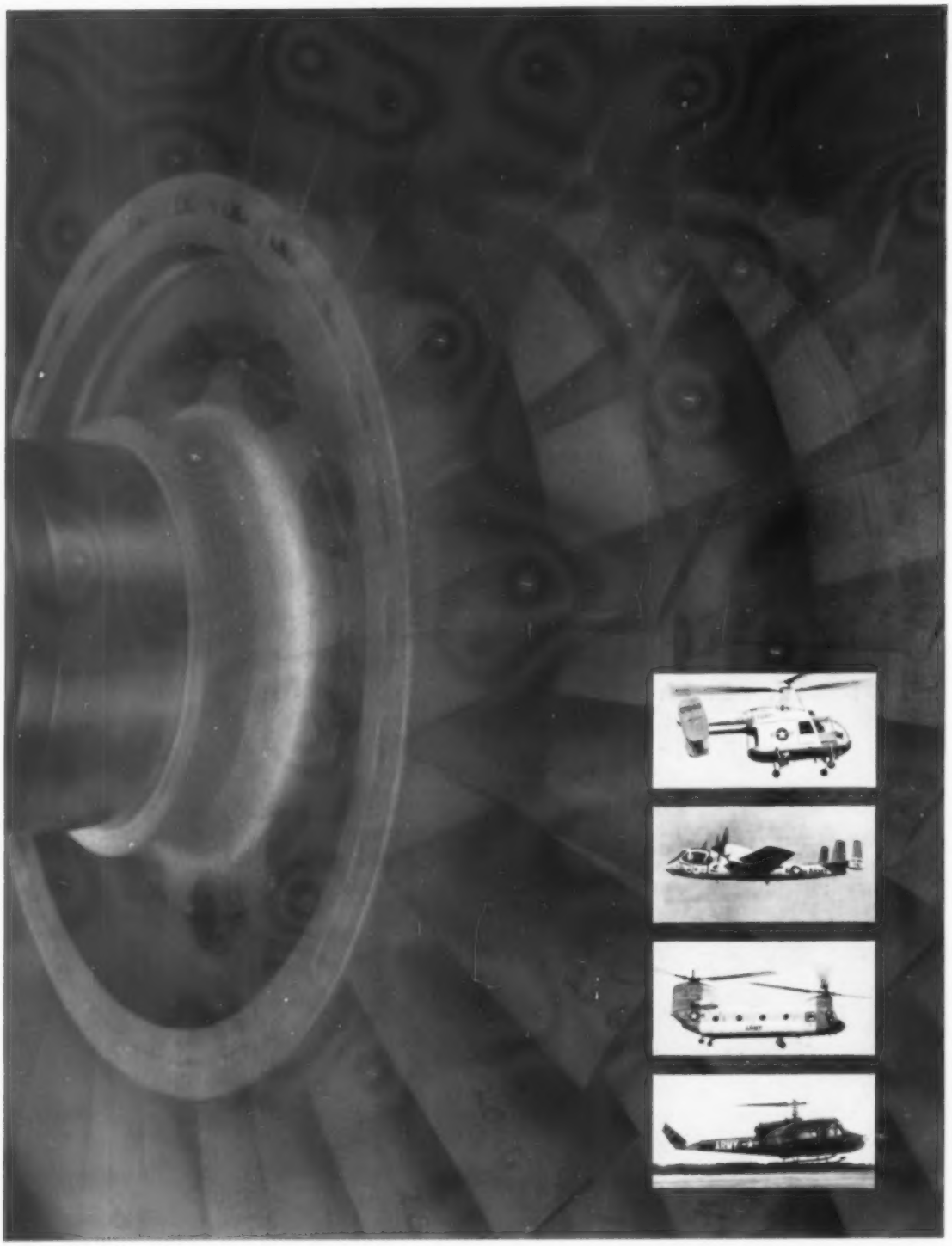

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